

76 North Meadowbrook Drive Alpine, UT 84004 office (201) 874-3483 swyssling@wysslingconsulting.com

December 12, 2022 Revised March 22, 2023

Titan Solar Power 210 North Sunway Drive Gilbert, AZ 85233

Scott Wyssling, Digitally signed by Scott Wyssling, PE
DN: C=US, S=Utah, L=Alpine, O=Wyssling
Consulting, OU=Engineering, CN="Scott
Wyssling, PE",
E=swyssling@wysslingconsulting.com
Reason: I am the author of this document
Location: your signing location here
Date: 2023.03.22 10:46:35-06'00'
Foxit PDF Editor Version: 11.1.0

Re: Engineering Services Lawrence Residence 12 Newhope Court, Cameron, NC 8.400 kW System

To Whom It May Concern:

We have received information regarding solar panel installation on the roof of the above referenced structure. Our evaluation of the structure is to verify the existing capacity of the roof system and its ability to support the additional loads imposed by the proposed solar system.

A. Site Assessment Information

- 1. Site visit documentation identifying attic information including size and spacing of framing for the existing roof structure.
- Design drawings of the proposed system including a site plan, roof plan and connection details for the solar panels. This information will be utilized for approval and construction of the proposed system.

B. Description of Structure:

Roof Framing: Prefabricated wood trusses at 24" on center. All top chord members are

constructed of 2x6 dimensional lumber and all other member constructed

of 2x4 dimensional lumber.

Roof Material: Composite Asphalt Shingles

Roof Slope: 40 & 45 degrees
Attic Access: Accessible
Foundation: Permanent

C. Loading Criteria Used

Dead Load

- Existing Roofing and framing = 7 psf
- New Solar Panels and Racking = 3 psf
- TOTAL = 10 PSF
- Live Load = 20 psf (reducible) 0 psf at locations of solar panels
- Ground Snow Load = 15 psf
- Wind Load based on ASCE 7-10
 - Ultimate Wind Speed = 119 mph (based on Risk Category II)
 - Exposure Category C

Analysis performed of the existing roof structure utilizing the above loading criteria is in accordance with the 2018 NCRC, including provisions allowing existing structures to not require strengthening if the new loads do not exceed existing design loads by 105% for gravity elements and 110% for seismic elements. This analysis indicates that the existing framing will support the additional panel loading without damage, if installed correctly.

D. Solar Panel Anchorage

1. The solar panels shall be mounted in accordance with the most recent K2 Systems installation manual. If during solar panel installation, the roof framing members appear unstable or deflect non-uniformly, our office should be notified before proceeding with the installation.

2. The maximum allowable withdrawal force for a M5 x 60mm lag screw is 213 lbs per inch of penetration as identified in the National Design Standards (NDS) of timber construction specifications. Based on a minimum penetration depth of 1-5/8", the allowable capacity per connection is greater than the design withdrawal force (demand). Considering the variable factors for the existing roof framing and installation tolerances, the connection using two (2) M5 x 60mm lag screw with a minimum of 1-5/8" embedment will be adequate and will include a sufficient factor of safety.

3. Considering the wind speed, roof slopes, size and spacing of framing members, and condition of the roof, the panel supports shall be placed no greater than 48" on center.

Based on the above evaluation, this office certifies that with the racking and mounting specified, the existing roof system will adequately support the additional loading imposed by the solar system. This evaluation is in conformance with the 2018 NCRC, current industry standards, and is based on information supplied to us at the time of this report.

Should you have any questions regarding the above or if you require further information do not hesitate to contact me.

1. -01

Scott E. Wyssling, PE North Carolina License



Wyssling Consulting, PLLC 76 N Meadowbrook Drive Alpine UT 84004 North Carolina COA # P-2308 Signed 3/22/2023

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Building Codes: 2017 NEC, 2018 NORTH CAROLINA RESIDENTIAL CODE, 2018 NORTH VICINITY MAP

CAROLINA FIRE CODE, 2018 NORTH CAROLINA BUILDING CODE and AHJ

Amendments



LAWRENCE, DARRELL PV SYSTEM 12 NEWHOPE CT.

CAMERON, NC, 28326 APN: 09956504 0282 94

JURISDICTION: HARNETT COUNTY (NC)

GÉNERÁL INFORMÁTIÓN

SYSTEM SIZE: 8.400 kW-DC-STC

7.600 kW-AC

40 DEGREES ROOF PITCHED:

INVERTER: (1) SOLAREDGE SE7600H-US W/ P340 OPTIMIZERS

(21) Q PEAK DUO BLK ML G10+ 400W MODULES: (1) x 10 (1) x 11 MODULE SERIES STRINGS STRINGS:

ELECTRICAL SERVICE RATING: 200A

PV SYSTEM OVERCURRENT RATING:

PV SYSTEM DISCONNECT SWITCH: EATON DG222URB (60A / 2P)

ROOF TYPE: COMP SHINGLE

MANUFACTURED/ENGINEERED TRUSS **ROOF FRAMING:**

RACKING: K2 SYSTEMS

ATTACHMENT METHOD: MIN. M5x60mm LAG SCREWS EA. STANDOFF

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AERIAL MAP

SCALE: NTS



NOTES

EQUIPMENT LOCATION

- ALL EQUIPMENT SHALL MEET MINIMUM SETBACKS AS REQUIRED BY NEC 110.26.
- 2. WIRING SYSTEMS INSTALLED IN DIRECT SUNLIGHT MUST BE RATED FOR EXPECTED OPERATING TEMPERATURE AS SPECIFIED BY NEC690.31(A),(C) AND NEC TABLES 310.15(B)(2)(A) AND 310.15(B)(3)(C).
- 3. JUNCTION AND PULL BOXES PERMITTED INSTALLED UNDER PV MODULES ACCORDING TO NEC 690.34.
- 4. ADDITIONAL AC DISCONNECT(S) SHALL BE PROVIDED WHERE THE INVERTER IS NOT WITHIN SIGHT OF THE AC SERVICING DISCONNECT
- 5. ALL EQUIPMENT SHALL BE INSTALLED ACCESSIBLE TO QUALIFIED PERSONNEL ACCORDING TO NEC APPLICABLE CODES.
- 6. ALL COMPONENTS ARE LISTED FOR THEIR PURPOSE AND RATED FOR OUTDOOR USAGE WHEN APPROPRIATE.

WIRING & CONDUIT NOTES

- ALL CONDUITS AND WIRE WILL BE LISTED AND APPROVED FOR THEIR PURPOSE. CONDUIT AND WIRE SPECIFICATIONS ARE BASED ON MINIMUM CODE REQUIREMENTS AND ARE NOT MEANT TO LIMIT UP-SIZING.
- 2. CONDUCTORS SIZED ACCORDING TO NEC 690.8, NEC 690.7.
- 3. DC WIRING LIMITED TO MODULE FOOTPRINT. MICRO INVERTER WIRING SYSTEMS SHALL BE LOCATED AND SECURED UNDER THE ARRAY WITH SUITABLE WIRING CLIPS.
- 4. AC CONDUCTORS COLORED OR MARKED AS FOLLOWS: PHASE A OR L1-BLACK, PHASE B OR L-2 RED, OR OTHER CONVENTION IF THREE PHASE, PHASE C OR L3-BLUE, YELLOW, ORANGE, OR OTHER CONVENTION NEUTRAL- WHITE OR GREY IN 4-WIRE DELTA CONNECTED SYSTEMS THE PHASE WITH THE HIGHER VOLTAGE TO BE MARKED ORANGE NEC 110.15.



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ON ANY ELECTRONIC COPIES

GENERAL NOTES

- 1. MODULES ARE LISTED UNDER UL 1703 AND CONFORM TO THE STANDARDS.
- 2. INVERTERS ARE LISTED UNDER UL 1741 AND CONFORM TO THE STANDARDS.
- 3. DRAWINGS ARE DIAGRAMMATIC, INDICATING GENERAL ARRANGEMENT OF THE PV SYSTEM AND THE ACTUAL SITE CONDITION
- 4. WORKING CLEARANCES AROUND THE NEW PV ELECTRICAL EQUIPMENT WILL BE MAINTAINED IN ACCORDANCE WITH NEC 110.26.
- 5. ALL GROUND WIRING CONNECTED TO THE MAIN SERVICE GROUNDING IN MAIN SERVICE PANEL/SERVICE COMPONENT.
- 6. ALL CONDUCTORS SHALL BE 600V, 75° C STANDARD COPPER UNLESS OTHERWISE NOTED.
- 7. WHEN REQUIRED, A LADDER SHALL BE IN PLACE FOR INSPECTION IN COMPLIANCE WITH OSHA REGULATIONS.
- 8. THE SYSTEM WILL NOT BE INTERCONNECTED BY THE CONTRACTOR UNTIL APPROVAL FROM THE LOCAL JURISDICTION AND/OR THE UTILITY.
- 9. ROOF ACCESS POINT SHALL BE LOCATED IN AREAS THAT DO NOT REQUIRE THE PLACEMENT OF GROUND LADDERS OVER OPENINGS SUCH AS WINDOWS WHERE THE ACCESS POINT DOES NOT CONFLICT WITH OVERHEAD OBSTRUCTIONS SUCH AS TREES, WIRES OR SIGNS.
- 10. PV ARRAY COMBINER/JUNCTION BOX PROVIDES TRANSITION FROM ARRAY WIRING TO CONDUIT WIRING.



LAWRENCE, DARRELL RESIDENCE 12 NEWHOPE CT, CAMERON, NC, 28326 LAT:35.266638, LON:-79.028569 TSP149350

(21) Q PEAK DUO BLK ML G10+ 400W (1) SOLAREDGE SE7600H-US 8.400 kW DC SYSTEM SIZE 7.600 kW AC SYSTEM SIZE

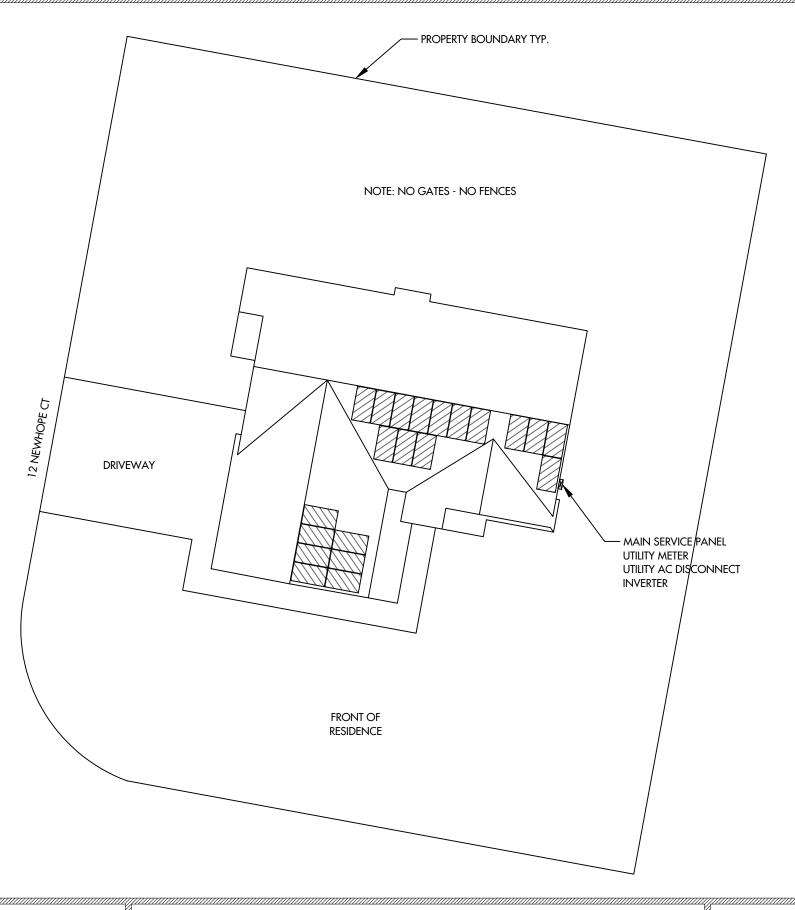
DATE: 3/22/2023

REV:A

DRAWN BY: CA

COVER PAGE

PV 1





PROJECT NOTES

- 1. UTILITY SHALL HAVE 24HR UNRESTRICTED ACCESS TO ALL PHOTOVOLTAIC COMPONENTS LOCATED AT SES EQUIPMENT
- 2. NO LOCKED GATES, DOGS, ETC SHALL IMPEDE ACCESS TO SES EQUIPMENT
- 3. WORKSPACE IN FRONT OF AC ELECTRICAL SYSTEM COMPONENTS SHALL BE IN ACCORDANCE WITH CENTRAL ELECTRIC MEMBERSHIP CORPORATION AND NEC REQUIREMENTS.



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SCALE: 15/256" = 1'-0" DATE: 3/22/2023

REV: A

DRAWN BY: CA

SITE PLAN

PV 2

ARRAY INFORMATION

AR-01

QUANTITY: 14

MOUNTING TYPE: FLUSH

ARRAY TILT: 40° AZIMUTH: 190°

ATTACHMENT SPACING: 4' ROOF TYPE: COMP SHINGLE

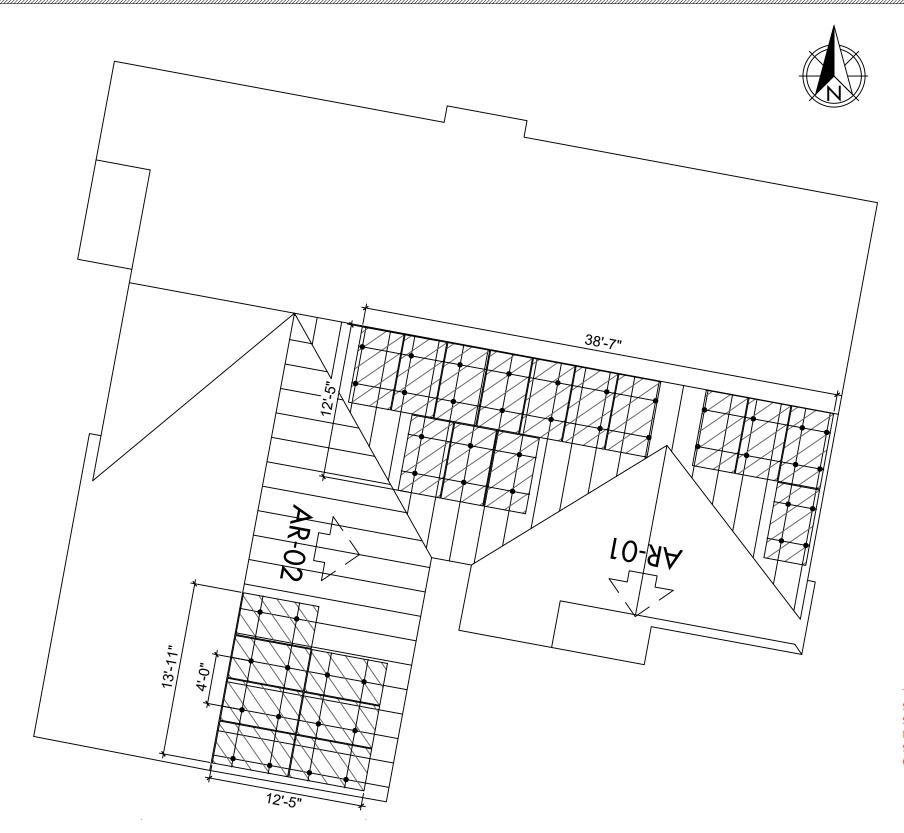
AR-02

QUANTITY: 7

MOUNTING TYPE: FLUSH

ARRAY TILT: 45° AZIMUTH: 100°

ATTACHMENT SPACING: 4' ROOF TYPE: COMP SHINGLE



NOTES

- ROOF VENTS, SKYLIGHTS, WILL NOT BE COVERED UPON PV INSTALLATION
- TOTAL ROOF AREA = 3794 SQ-FT
- TOTAL ARRAY AREA = 443.54 SQ-FT
- ARRAY COVERAGE = 11.69%



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SCALE: 33/256" = 1'-0" DATE: 3/22/2023

REV:A

DRAWN BY: CA

PV LAYOUT PV 3

MODULE & RACKING INFORMATION
MODULE: Q PEAK DUO BLK ML G10+ 400W
MODULE WEIGHT: 48.50 LBS
MODULE DIMENSIONS: 74"x 41.1" x 1.5"

RACKING/RAIL: K2 SYSTEMS / K2 SYSTEMS

ROOF & FRAMING INFORMATION
MATERIAL: COMP SHINGLE
RAFTER/TRUSS SIZE: 2" x 6"
RAFTER/TRUSS SPACING: 2'

ARRAY 01: 14 MODULES

UPLIFT = 8870.75 LBS.

POINT LOAD = 26.00 LBS. PER MOUNTING POINT

PULLOUT STRENGTH = 14700.00 LBS.

DISTRIBUTED LOAD = 2.46 PSF

MODULE & RACKING WEIGHT = 728.00 LBS

ARRAY 02: 7 MODULES

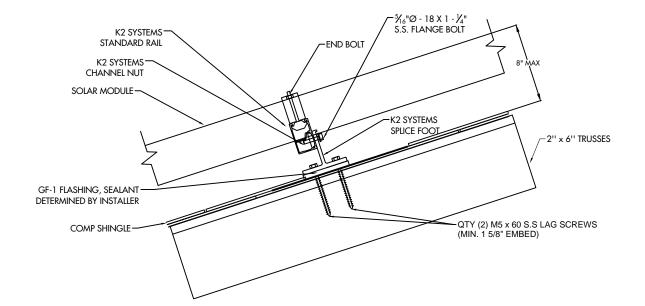
 $\underline{\mathsf{UPLIFT}} = \underline{4435}.38 \; \mathsf{LBS}.$

POINT LOAD = 26.00 LBS. PER MOUNTING POINT

PULLOUT STRENGTH = 7350.00 LBS.

DISTRIBUTED LOAD = 2.46 PSF

MODULE & RACKING WEIGHT = 364.00 LBS





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DATE: 3/22/2023

REV:A

DRAWN BY: CA

DETAILS

PV 4

PV MODULE

Q PEAK DUO BLK ML G10+ 400W

400 W 11.14 ADC VOC 45.30 VDC

IMP 10.77 ADC VMP 37.13 VDC TVOC = -0.270% / °C

WIRE SCHEDULE

- A (4) #10 AWG-CU PV WIRE (HR) (1) #10 AWG-CU BARE COPPER WIRE (GND) IN FREE AIR
- B (4) #10 AWG-CU THWN-2 WIRE (HR) (1) #10 AWG-CU THWN-2 WIRE (GND) 3/4" EMT

C - (3) #8 AWG-CU THWN-2 WIRE (HR) (1) #8 AWG-CU THWN-2 WIRE (GND)

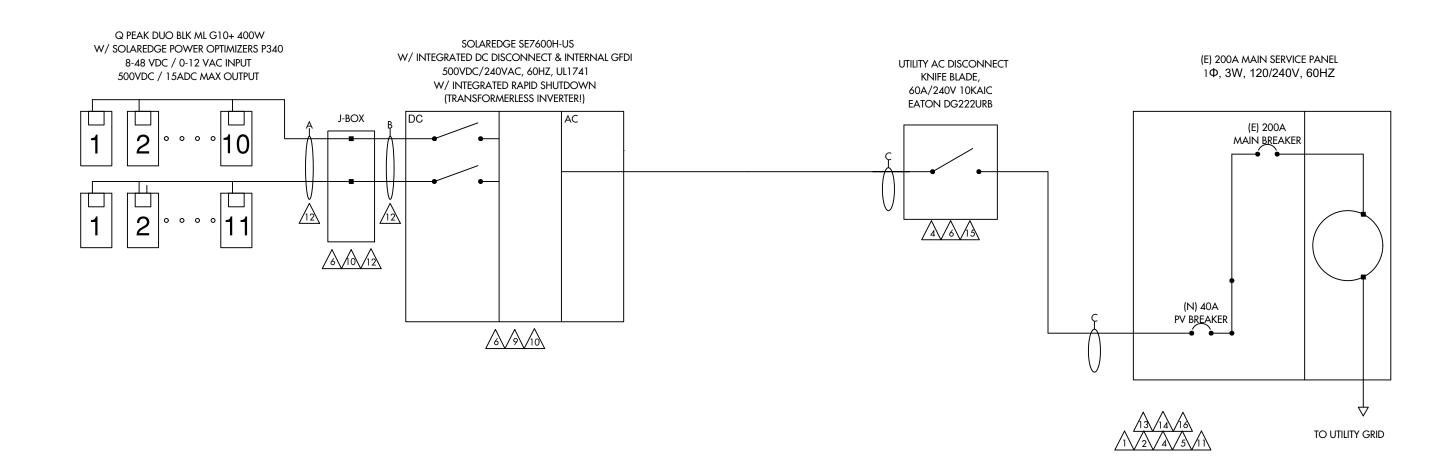
3/4" EMT

MAIN SERVICE PANEL

BUS RATING 200A

MAX. CURRENT RATING 240A (200A X 1.2)

SOLAR BACKFEED 40A MAIN BREAKER 200A TOTAL 240A



WIRE SIZE CALCULATIONS

TEMP CORRECTION FACTOR: 0.87 (43° AMBIENT) ROOFTOP TEMP CORRECTION FACTOR: 1.00 (43° ADJUSTED) (2" ABOVE ROOFTOP / 0° TEMP ADDERS - AS OCCURS) (TEMP DATA TAKEN FROM ASHRAE 2% AVG HIGH TEMP)

DC WIRING

CONDUIT FILL FACTOR 0.80

OPTIMIZER MAX. CURRENT = 18.75A DC (15.00A X 1 X 1.25)

#10- AWG CU. AMPACITY = 47.85A (55A X 0.87)

FREE AIR

#10 - AWG CU. AMPACITY = 27.84A (40A X 0.87 X 0.80)

ROOFTOP CONDUIT

AC WIRING

CONDUIT FILL FACTOR 1 (3) CONDUCTORS

MAX. INVERTER CURRENT = 32A (PER INVERTER SPECS)

MIN. INVERTER OCP 40A (32A X 1.25)

INVERTER OCP 40A

#8 - AWG CU AMPACITY 47.85A (55A X 1 X 0.87)



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(21) Q PEAK DUO BLK ML G10+ 400W (1) SOLAREDGE SE7600H-US 8.400 kW DC SYSTEM SIZE 7.600 kW AC SYSTEM SIZE

DATE: 3/22/2023

REV:A

DRAWN BY: CA

ONE LINE

PV 5

PV MODULE

Q PEAK DUO BLK ML G10+ 400W

400 W 11.14 ADC

VOC 45.30 VDC 10.77 ADC IMP

VMP 37.13 VDC TVOC = -0.270% / °C

WIRE SCHEDULE

A - (4) #10 AWG-CU PV WIRE (HR) (1) #10 AWG-CU BARE COPPER WIRE (GND) IN FREE AIR

B - (4) #10 AWG-CU THWN-2 WIRE (HR) (1) #10 AWG-CU THWN-2 WIRE (GND) 3/4" EMT

C - (3) #8 AWG-CU THWN-2 WIRE (HR)

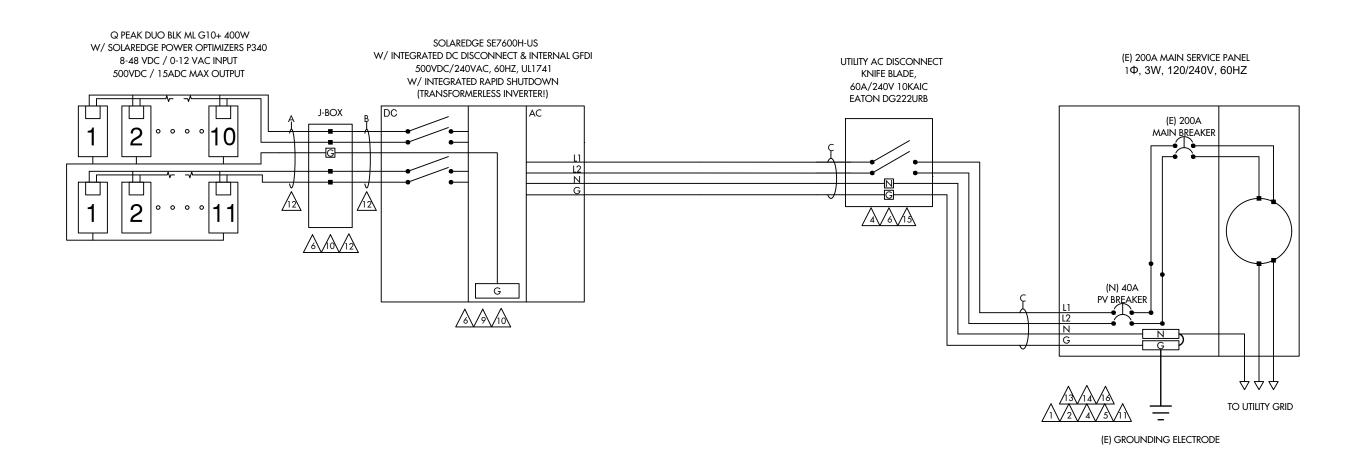
(1) #8 AWG-CU THWN-2 WIRE (GND) 3/4" EMT

MAIN SERVICE PANEL

BUS RATING 200A

MAX. CURRENT RATING 240A (200A X 1.2)

SOLAR BACKFEED 40A MAIN BREAKER 200A TOTAL 240A



WIRE SIZE CALCULATIONS

TEMP CORRECTION FACTOR: 0.87 (43° AMBIENT) ROOFTOP TEMP CORRECTION FACTOR: 1.00 (43° ADJUSTED) (2" ABOVE ROOFTOP / 0° TEMP ADDERS - AS OCCURS) (TEMP DATA TAKEN FROM ASHRAE 2% AVG HIGH TEMP)

DC WIRING

CONDUIT FILL FACTOR 0.80

OPTIMIZER MAX. CURRENT = 18.75A DC (15.00A X 1 X 1.25) #10- AWG CU. AMPACITY = 47.85A (55A X 0.87)

FREE AIR

#10 - AWG CU. AMPACITY = 27.84A (40A X 0.87 X 0.80)

ROOFTOP CONDUIT

AC WIRING

CONDUIT FILL FACTOR 1 (3) CONDUCTORS MAX. INVERTER CURRENT = 32A (PER INVERTER SPECS)

MIN. INVERTER OCP 40A (32A X 1.25)

INVERTER OCP 40A

47.85A (55A X 1 X 0.87) #8 - AWG CU AMPACITY



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(21) Q PEAK DUO BLK ML G10+ 400W (1) SOLAREDGE SE7600H-US 8.400 kW DC SYSTEM SIZE 7.600 kW AC SYSTEM SIZE

DATE: 3/22/2023

REV:A

DRAWN BY: CA

THREE LINE

PV 6



A CAUTION

PHOTOVOLTAIC SYSTEM CIRCUIT IS BACKFED

LOCATION: BACKFED BREAKER CODE REF: NEC 705.12(4)



M WARNING

DO NOT RELOCATE THIS

OVERCURRENT DEVICE

LOCATION: BACKFED BREAKER

CODE REF: 2017 NEC 705.12(2)(3)(b)



WARNING

A GENERATION SCOURCE IS CONNECTED TO THE SUPPLY HE PHOTOVOLTAIC SYSTEM UTILITY DISCONNECT SWITCH

LOCATION: (IF APPLICABLE) SUPPLY SIDE TAP

AC DISCONNECT(S)

CODE REF: UTILITY



PHOTOVOLTAIC AC DISCONNECT

ATED AC OPERATING CURRENT

32A AC

NOMINAL OPERATING AC VOLTAGE:

240VAC

CODE REF: NEC 690.54

LOCATION: MAIN PANEL



RAPID SHUTDOWN **SWITCH FOR SOLAR PV SYSTEM**

LOCATION: MAIN PANEL (EXTERIOR)

CODE REF: NEC 690.56(C)(3)



 \triangle

WARNING

ELECTRICAL SHOCK HAZARD TERMINALS ON BOTH LINE AND LOAD SIDES MAY BE ENERGIZED IN THE OPEN POSITION

LOCATION: COMBINER PANEL AC DISCONNECT JUNCTION BOX

CODE REF: NEC 690.13(B)

SYSTEM METER

8

MARNING

MAXIMUM VOLTAGE

MAXIMUM CIRCUIT CURRENT

MAX. RATED OUTPUT CURRENT OF

THE CHARGE CONTROLLER OR DC-

TO-DC- CONVERTER (IF INSTALLED)

M WARNING

ELECTRICAL SHOCK HAZARD

TERMINALS ON BOTH LINE AND

LOAD SIDES MAY BE ENERGIZED

IN THE OPEN POSITION

DC VOLTAGE IS ALWAYS PRESENT WHEN SOLAR MODULES ARE

EXPOSED TO SUNLIGHT

SOLAR PV SYSTEM EQUIPPED

PHOTOVOLTAIC SYSTEM **COMBINER PANEL**

DO NOT ADD LOADS

PHOTOVOLTAIC SYSTEM DC DISCONNECT



A CAUTION

DUAL POWER SOURCE SECOND SOURCE IS **PHOTOVOLTAIC**

LOCATION: SERVICE METER

<u>/14\</u>

WARNING

INVERTER OUTPUT CONNECTION

DO NOT RELOCATE THIS **OVERCURRENT DEVICE**

LOCATION: (IF APPLICABLE) SERVICE PANEL

CODE REF: NEC 705.12(7)

13

PHOTOVOLTAIC SYSTEM **UTILITY DISCONNECT SYSTEM**

LOCATION: AC DISCONNECT

CODE REF: UTILITY



PV SOLAR BREAKER

/18

DO NOT RELOCATE THIS **OVERCURRENT DEVICE**

LOCATION: MAIN PANEL: (EXTERIOR)

PV BREAKER: (INTERIOR)

CODE REF: NEC 705.12(B)(2)(3)(B)

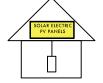
PHOTOVOLTAIC

LOCATION: DEDICATED KWH METER CODE REF: NEC 690.4(B) UTILITY

/10\

WITH RAPID SHUTDOWN

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



LOCATION: MAIN SERVICE (OUTSIDE COVER) CODE REF: NEC 690.12 NEC 690.56(C)(1)(a

YELLOW STICKER

LOCATION: AC COMBINER PANEL

LOCATION: DC DISCONNECT

CODE REF: UTILITY

LOCATION: DC DISCONNECT, COMBINE BOX

CODE REF: NEC 690.13(B)

CODE REF: NEC 690.13(B)



WARNING PHOTOVOLTAIC POWER SOURCE

LOCATION: DC CONDUIT JUNCTION BOX NO MORE THAN 10FT CODE REF: NEC 690.31(G)(3) NEC 690 31/G)(4)

REFLECTIVE AND WEATHER RESISTANT

LABEL REQUIRES CAPITALIZED LETTERS WITH A MINIMUM HEIGHT OF 3/8 INCH, WHITE LETTERS ON RED BACKGROUND LABELS SHALL BE PLACED ON INTERIOR AND EXTERIOR DC CONDUIT, RACEWAYS, ENCLOSURES, AND CABLE ASSEMBLIES EVERY 10 FEET, WITHIN 1 FOOT OF TURNS OR BENDS AND WITHIN 1 FOOT ABOVE AND BELOW PENETRATIONS OF ROOF/CEILING ASSEMBLIES, WALLS OR BARRIERS.



(21) Q PEAK DUO BLK ML G10+ 400W (1) SOLAREDGE SE7600H-US 8.400 kW DC SYSTEM SIZE 7.600 kW AC SYSTEM SIZE

DATE: 3/22/2023

REV: A

DRAWN BY: CA

LABELS

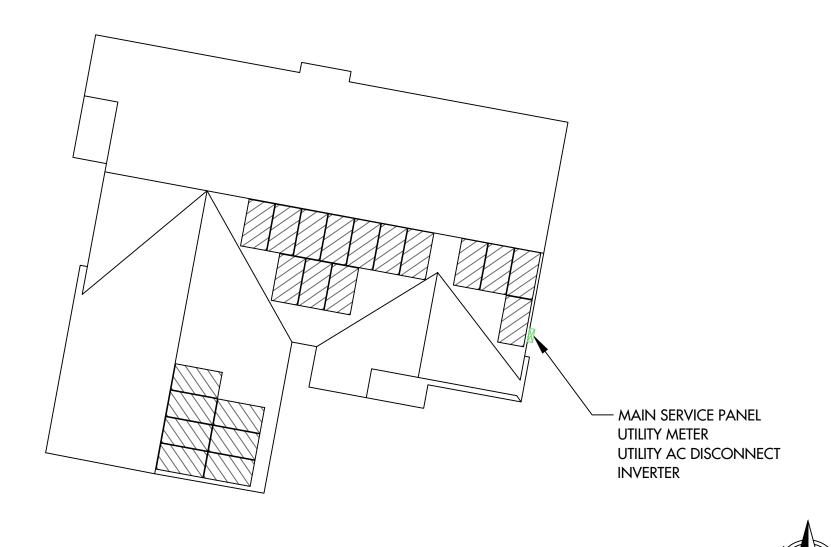
PV 7



LAWRENCE, DARRELL RESIDENCE 12 NEWHOPE CT, CAMERON, NC, 28326 LAT:35.266638, LON:-79.028569 TSP149350

CAUTION

POWER TO THIS BUILDING IS SUPPLIED FROM THE FOLLOWING SOURCES WITH DISCONNECTS AS SHOWN:



DIRECTORY PLAQUE IN ACCORDANCE WITH NEC690.56(A)(B), 705.10

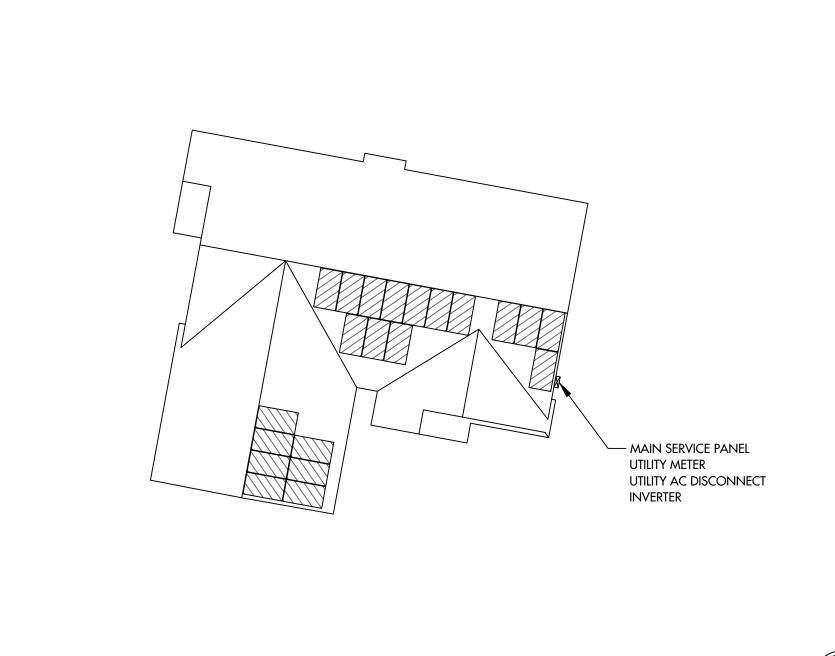


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DATE: 3/22/2023 REV: A DRAWN BY: CA PLACARD

PV 8

JOB SAFETY PLAN



LOCATION OF NEAREST URGENT CARE FACILITY

NAME:

ADDRESS:

PHONE NUMBER:

NOTES:

- INSTALLER SHALL DRAW IN DESIGNATED SAFETY AREA AROUND HOME
- INSTALLER SHALL UPDATE NAME, ADDRESS, AND PHONE NUMBER OF NEAREST URGENT CARE FACILITY RELATIVE TO THE JOB SITE BEFORE STARTING WORK.

PRINT NAME	INITIAL	YES	NO



CONTRACTOR LIC# U.34445

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(21) Q PEAK DUO BLK ML G10+ 400W (1) SOLAREDGE SE7600H-US 8.400 kW DC SYSTEM SIZE 7.600 kW AC SYSTEM SIZE

DATE: 3/22/2023

REV: A

DRAWN BY: CA

SAFETY PLAN

PV 9

Single Phase Inverter with HD-Wave Technology

for North America

SE3000H-US / SE3800H-US / SE5000H-US / SE6000H-US / SE7600H-US / SE10000H-US / SE11400H-US



Optimized installation with HD-Wave technology

- Specifically designed to work with power optimizers
 UL1741 SA certified, for CPUC Rule 21 grid compliance
- Record-breaking 99% weighted efficiency
- Quick and easy inverter commissioning directly from a smartphone using the SolarEdge SetApp
- Fixed voltage inverter for longer strings

solaredge.com

- Integrated arc fault protection and rapid shutdown for NEC 2014 and 2017, per article 690.11 and 690.12

INVERTERS

- / Small, lightweight, and easy to install both outdoors or indoors
- Built-in module-level monitoring
- / Optional: Faster installations with built-in consumption metering (1% accuracy) and production revenue grade metering (0.5% accuracy, ANSI C12.20)

/ Single Phase Inverter with HD-Wave Technology for North America

SE3000H-US / SE3800H-US / SE5000H-US / SE6000H-US/ SE7600H-US / SE10000H-US / SE11400H-US

MODEL NUMBER	SE3000H-US	SE3800H-US	SE5000H-US	SE6000H-US	SE7600H-US	SE10000H-US	SE11400H-US	
APPLICABLE TO INVERTERS WITH PART NUMBER	SEXXXXH-XXXXXBXX4							
OUTPUT								
Rated AC Power Output	3000	3800 @ 240V 3300 @ 208V	5000	6000 @ 240V 5000 @ 208V	7600	10000	11400 @ 240V 10000 @ 208V	VA
Maximum AC Power Output	3000	3800 @ 240V 3300 @ 208V	5000	6000 @ 240V 5000 @ 208V	7600	10000	11400 @ 240V 10000 @ 208V	VA
AC Output Voltage MinNomMax. (211 - 240 - 264)	·	✓	✓	✓	√	✓	✓	Vac
AC Output Voltage MinNomMax. (183 - 208 - 229)	-	✓	-	✓	-	-	✓	Vac
AC Frequency (Nominal)				59.3 - 60 - 60.5(1)				Hz
Maximum Continuous Output Current @240V	12.5	16	21	25	32	42	47.5	А
Maximum Continuous Output Current @208V	-	16	-	24	-	-	48.5	Α
Power Factor			1	, Adjustable - 0.85 to	0.85			
GFDI Threshold				1				A
Utility Monitoring, Islanding Protection, Country Configurable Thresholds				Yes				
INPUT								
Maximum DC Power @240V	4650	5900	7750	9300	11800	15500	17650	W
Maximum DC Power @208V	-	5100	-	7750	-	-	15500	W
Transformer-less, Ungrounded	i.			Yes				
Maximum Input Voltage				480				Vdc
Nominal DC Input Voltage		3	380			400		Vdc
Maximum Input Current @240V ⁽²⁾	8.5	10.5	13.5	16.5	20	27	30.5	Add
Maximum Input Current @208V ⁽²⁾	-	9	-	13.5	-	-	27	Add
Max. Input Short Circuit Current		45						
Reverse-Polarity Protection		Yes						
Ground-Fault Isolation Detection		600kΩ Sensitivity						
Maximum Inverter Efficiency	99			9	9.2			%
CEC Weighted Efficiency		99 9240V 98.5 @ 208V						
Nighttime Power Consumption				< 2.5				W

solaredge

/ Single Phase Inverter with HD-Wave Technology for North America

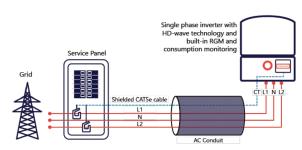
SE3000H-US / SE3800H-US / SE5000H-US / SE6000H-US/ SE7600H-US / SE10000H-US / SE11400H-US

MODEL NUMBER SE30	000H-US SE3800H	H-US SE5000H-US S	E6000H-US SE76	600H-US SE10000H-US SE11400H-US	;		
ADDITIONAL FEATURES							
Supported Communication Interfaces		RS485, Ethernet, 2	igBee (optional), Cellular	(optional)			
Revenue Grade Metering, ANSI C12.20			Optional ⁽³⁾				
Consumption metering							
Inverter Commissioning	With t	the SetApp mobile application	using Built-in Wi-Fi Acces	ss Point for Local Connection			
Rapid Shutdown - NEC 2014 and 2017 690.12	Automatic Rapid Shutdown upon AC Grid Disconnect						
STANDARD COMPLIANCE							
Safety	Ļ	UL1741, UL1741 SA, UL1699B, CSA C22.2, Canadian AFCI according to T.I.L. M-07					
Grid Connection Standards		IEEE15	47, Rule 21, Rule 14 (HI)				
Emissions		f	CC Part 15 Class B				
INSTALLATION SPECIFICATIONS	S						
AC Output Conduit Size / AWG Range		1" Maximum / 14-6 AWG		1" Maximum /14-4 AWG			
DC Input Conduit Size / # of Strings / AWG Range	1	" Maximum / 1-2 strings / 14-6	AWG	1" Maximum / 1-3 strings / 14-6 AWG			
Dimensions with Safety Switch (HxWxD)		17.7 x 14.6 x 6.8 / 450 x 370 x	174	21.3 x 14.6 x 7.3 / 540 x 370 x 185	in / mm		
Weight with Safety Switch	22 / 10	25.1 / 11.4	26.2 / 11.9	38.8 / 17.6	lb / kg		
Noise		< 25		<50	dBA		
Cooling		1	latural Convection				
Operating Temperature Range		-40	o +140 / -40 to +60 ⁽⁴⁾		°F / °C		
Protection Rating		NEMA 4X (Inverter with Safety Switch)					

erter with Revenue Grade Meter F/N; 5:2000R-1050UDBNL-3; Inverter with Revenue Grade Produ ould be ordered separately, SEACT0750-200NA-20 or SEACT0750-400NA-20. 20 units per box power up to at least 50°C / 122°F; for power de-rating information refer to: https://www.solare

How to Enable Consumption Monitoring

By simply wiring current transformers through the inverter's existing AC conduits and connecting them to the service panel, home household energy usage helping them to avoid high electricity bills







LAWRENCE, DARRELL RESIDENCE 12 NEWHOPE CT, CAMERON, NC, 28326 LAT:35.266638, LON:-79.028569 TSP149350

(21) Q PEAK DUO BLK ML G10+ 400W (1) SOLAREDGE SE7600H-US 8.400 kW DC SYSTEM SIZE 7.600 kW AC SYSTEM SIZE

DATE: 3/22/2023 REV: A

DRAWN BY: CA

EQUIPMENT SPECIFICATIONS PV 10



Intertek 3933 US Route 11 Cortland, NY 13045 Telephone: 607-753-7311 www.intertek.com

Subject: ETL Evaluation of SolarEdge Products to Rapid Shutdown Requirements

To, whom it may concern

This letter represents the testing results of the below listed products to the requirements contained in the following standards:

The evaluation was done on the PV Rapid Shutdown System (PVRSS), and covers installations consisting of optimizers and inverters with part numbers listed below.

The testing done has verified that controlled conductors are limited to:

- Not more than 30 volts and 240 voltamperes within 30 seconds of rapid shutdown initiation outside the array.
- Not more than 80 volts and 240 voltamperes within 30 seconds of rapid shutdown initiation inside the array.

The rapid shutdown initiation is performed by either disconnecting the AC feed to the inverter, or – if the inverter DC Safety switch is readily accessible – by turning off the DC Safety switch.

Applicable products:

(1) Power optimizers:

PB followed by 001 to 350; followed by -AOB or -TFI.
OP followed by 001 to 500; followed by -LV, -MV, -IV or -EV.
P followed by 001 to 1100.
SP followed by 001 to 350.

When optimizers are connected to 2 or more modules in series, the max input voltage may exceed 80V. Following the implementation of the NEC 2017 rapid shutdown value of 80V max inside of the array at the beginning of 2019, modules exceeding this combined input max voltage will be required to use optimizers with parallel inputs. Also meeting NEC 2020 rapid shutdown requirement.

(2) 1 -PH Inverters

 $SE3000A-US\ /\ SE3800A-US\ /\ SE5000A-US\ /\ SE6000A-US\ /\ SE7600A-US\ /\ SE10000A-US\ /\ SE11400A-US\ /\ SE3000H-US\ /\ SE$

Inverter part number may be followed by a suffix.

(3) 3 -PH Inverters



Intertek 3933 US Route 11 Cortland, NY 13045 Telephone: 607-753-7311

SE9KUS / SE10KUS / SE14.4KUS/ SE16.7kUS / SE17.3kUS / SE20KUS/ SE24KUS / SE30KUS / SE33.3KUS / SE40KUS / SE40KUS / SE50KUS / SE50KUS / SE66.6KUS / SE80KUS / SE85KUS / SE100KUS / SE120KUS; when the following label is labeled on the side of the inverter:

Please note, this Letter Report does not represent authorization for the use of any Intertek certification marks.

Brand Name(s) SolarEdge

Relevant Standard(s) UL 1741, UL 1741 CRD for rapid shutdown

National Electric Code, 2020, Section 690.12 requirement for

rapid shutdown

Verification Issuing Office 3933 US Route 11, Cortland, NY 13045

NRTL Disclaimer, Different for each NRTL – Example: "This Verification is for the exclusive use of NRTL's Client and is provided pursuant to the agreement between NRTL and its Client. NRTL's responsibility and liability are limited to the terms and conditions of the agreement. NRTL assumes no liability to any party, other than to the Client in accordance with the agreement, for any loss, expense or damage occasioned by the use of this Verification. Only the Client is authorized to copy or distribute this Verification. Any use of the NRTL name or one of its marks for the sale or advertisement of the tested material, product or service must first be approved in writing by NRTL. The observations and test results referenced from this Verification are relevant only to the sample tested. This Verification by itself does not imply that the material, product, or service is or has ever been under an NRTL certification program."

Signature:

Name: Mukund Rana Position: Staff Engineer Date:5/17/2021



Intertek 3933 US Route 11 Cortland, NY 13045 Telephone: 607-753-7311 www.intertek.com

Date	Engineer / Reviewer	Description
5/17/2021 G104683664CRT	Dishant Patel	Added New 3-PH Inverter model SE50KUS, SE80KUS, SE85KUS and SE120KUS.
	Mukund Rana	Updated Power optimizers from "P followed by 001 to 960" to "P followed by 001 to 1100"
		Updated NEC standard from "National Electric Code, 2017, Section 690.12 requirement for rapid shutdown" To "National Electric Code, 2020, Section 690.12 requirement for rapid shutdown"



POWER Power Optimizer For North America P320 / P340 / P370 / P400 / P401 / P405 / P485 / P505 25 YEAR **OPTIMIZE**

PV power optimization at the module-level

- Specifically designed to work with SolarEdge
- / Up to 25% more energy
- Superior efficiency (99.5%)
- Mitigates all types of module mismatch losses, from manufacturing tolerance to partial
- Flexible system design for maximum space

- Fast installation with a single bolt
- / Next generation maintenance with modulelevel 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.com

/ Power Optimizer For North America

P320 / P340 / P370 / P400 / P401 / P405 / P485 / 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)	P401 (for high power 60 and 72 cell modules)	P405 (for high- voltage modules)	P485 (for high- voltage modules)	P505 (for higher current modules)	
INPUT									
Rated input DC Power ⁽ⁱ⁾	320	340	370	4	00	405	485	505	W
Absolute Maximum Input Voltage (Voc at lowest temperature)	4	18	60	80	60	12	5(2)	83@	Vdc
MPPT Operating Range	8 -	48	8 - 60	8 - 80	8-60	12.5	- 105	12.5 - 83	Vdc
Maximum Short Circuit Current (Isc)		11		10.1	11.75	*	1	14	Add
Maximum Efficiency				99.	.5				95
Weighted Efficiency				98.8				98.6	%
Overvoltage Category				1					
OUTPUT DURING OPER	ATION (POV	VER OPTIMI	ZER CONNEC	TED TO OPE	RATING SOI	LAREDGE IN	VERTER)		
Maximum Output Current				15	i				Add
Maximum Output Voltage			60				85		Vdc
OUTPUT DURING STAND	DBY (POWER	OPTIMIZER	DISCONNECT	ED FROM SO	DLAREDGE IN	VERTER OR	SOLAREDGI	E INVERTER C	OFF)
Safety Output Voltage per Power Optimizer		1±0.1							Vdc
STANDARD COMPLIAN	CE								
EMC			FCC Pa	rt15 Class 3, IEC6	1000-6-2, IEC6100	0-6-3			
Safety				IEC62109-1 (class	safety), U_1741				
Material				UL94 V-0 , L	JV Resistant				
RoHS				Ye	S				
INSTALLATION SPECIFIC	CATIONS								
Maximum Allowed System Voltage				100	00				Vdc
Compatible inverters			All SolarE	dge Single Phase	and Three Phase i	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 153 x 29.5 /5.1 x 6 x 1.16	129 x 159 x 49.5	5 / 5.1 x 6.3 x 1.9	129 x 162 x 59 / 5.1 x 6.4 x 2.3	mn /in
Weight (including cables)		630 / 1.4		750 / 1.7	655 / 1.5	845	/ 1.9	1064 / 2.3	gr/
Input Connector			MC	4(3)			Single or dua MC4 ⁽³⁾⁽⁴⁾	MC4 ⁽³⁾	
Input Wire Length				0.16 /	0.52				m/
Output Wire Type / Connector				Double Irsul					
Output Wire Length	0.9 /	2.95		·	1.2 /	3.9			m/
Operating Temperature Range ⁽⁵⁾				-40 - +85 /	-40 - +185				°C /
THE RESIDENCE OF THE PARTY OF T		IP68 / NEMA6P							
Protection Rating		C - 100							

(1) Rated power of the module at STC will not exceed the optimizer "Rated Input DC Power". Modules with up to +5% power tolerance are allowed (2) INCC 2017 requires maximput voltage be not more than 80V (3) For other connector Types place contact Standardige (4) For dual version for parallel connection of two modules use P485-4NMDMRM. In the case of an odd number of PV modules in one string, installing one P485 dual version power optimizer connected to one PV module. When connecting a single module seal the unused input connectors with the supplied pair of seals.

(5) For ambient temperature above +85°C / +83°F power de-rating is applied. Refer to Power Optimizers Temperature De-Rating Technical Note for more details.

PV System Design Using a SolarEdge Inverter ⁽⁶⁾⁽⁷⁾		Single Phase HD-Wave			Three Phase for 277/480V grid	
Minimum String Length	P320, P340, P370, P400, P401	3	3	10	18	
(Power Optimizers)	P405, P485, P505	6		8	14	
Maximum String Length (Power	Maximum String Length (Power Optimizers)		25		50(8)	
Maximum Power per String		5700 (6000 with SE7600-US - SE11400- US)	5250	6000 ⁽⁹⁾	12750(10)	W
Parallel Strings of Different Lengths or Orientations		Yes				

(6) For detailed string sizing information refer to: http://www.solaredge.com/sites/detault/iles/string_sizing_na.pdf
(7) It is not allowed to mix P405;P485;P505 with P320;P342(P9370;P400;P401 in one string
(a)) A string with more than 30 opt mizers does not meet IRC rapid shutdown requirements; safety voltage will be above the 30V requirement
(9) For 208V gold, it is allowed to install up to 7,200W per string when the maximum power difference between each string is 1,000W
(10) For 27/748UV grid. It is allowed to install up to 15,000W per string when the maximum power difference between each string is 2,000W

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(21) Q PEAK DUO BLK ML G10+ 400W (1) SOLAREDGE SE7600H-US 8.400 kW DC SYSTEM SIZE 7.600 kW AC SYSTEM SIZE

DATE: 3/22/2023

REV: A

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EQUIPMENT SPECIFICATIONS PV 12













BREAKING THE 20% EFFICIENCY BARRIER

Q.ANTUM DUO Z Technology with zero gap cell layout boosts module efficiency up to 20.9 %.



INDUSTRY'S MOST THOROUGH TESTING

Q CELLS is the first solar module manufacturer to pass the most comprehensive quality programme in the industry:

The new "Quality Controlled PV" of the independent certification institute TÜV Rheinland



ENDURING HIGH PERFORMANCE

Long-term yield security with Anti LID Technology, Anti PID Technology1, 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 warranty2.



INNOVATIVE ALL-WEATHER TECHNOLOGY

CELLS

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

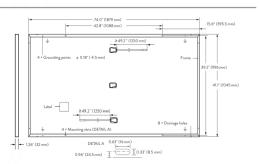
Q PEAK DUO BLK ML-G10+

395-400

THE IDEAL SOLUTION FOR: Rooftop arrays on residential buildings

MECHANICAL SPECIFICATION

FORMAT	74.0 in × 41.1 in × 1.26 in (including frame) (1879 mm × 1045 mm × 32 mm)
WEIGHT	48.5 lbs (22.0 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 × 22 monocrystalline Q.ANTUM solar half cells
JUNCTION BOX	2.09-3.98 in × 1.26-2.36 in × 0.59-0.71 in (53-101 mm × 32-60 mm × 15-18 mm), IP67, with bypass diodes
CABLE	4 mm² Solar cable; (+) ≥ 49.2 in (1250 mm), (-) ≥ 49.2 in (1250 mm)
CONNECTOR	Stäubli MC4: IP68



ELECTRICAL CHARACTERISTICS

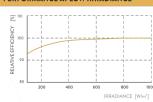
POV	VER CLASS			385	390	395	400	405
MIN	IIMUM PERFORMANCE AT STANDARD	rest conditions	, STC 1 (PC	OWER TOLERANCE +5	W / -0 W)			
	POWER AT MPP	P _{MPP}	[W]	385	390	395	400	405
₹	SHORT CIRCUIT CURRENT	I _{sc}	[A]	11.04	11.07	11.10	11.14	11.17
3	OPEN CIRCUIT VOLTAGE	V _{oc}	[V]	45.19	45.23	45.27	45.30	45.34
¥	CURRENT AT MPP	I _{MPP}	[A]	10.59	10.65	10.71	10.77	10.83
~	VOLTAGE AT MPP	V_{MPP}	[V]	36.36	36.62	36.88	37.13	37.39
	EFFICIENCY	η	[%]	≥19.6	≥19.9	≥20.1	≥20.4	≥20.6
MIN	IIMUM PERFORMANCE AT NORMAL O	PERATING CONDIT	rions, nmo	T 2				
	POWER AT MPP	P _{MPP}	[W]	288.8	292.6	296.3	300.1	303.8
5	SHORT CIRCUIT CURRENT	I _{sc}	[A]	8.90	8.92	8.95	8.97	9.00
₹	OPEN CIRCUIT VOLTAGE	Voc	[V]	42.62	42.65	42.69	42.72	42.76
Z X	CURRENT AT MPP	I _{MPP}	[A]	8.35	8.41	8.46	8.51	8.57
	VOLTAGE AT MPP	V _{MPP}	[V]	34.59	34.81	35.03	35.25	35.46

4Measurement tolerances PMPP ±3%; Isc; Vac ±5% at STC: 1000 W/m², 25±2°C, AM 1.5 according to IEC 60904-3 • 2800 W/m², NMOT, spectrum AM 1.5

Q CELLS PERFORMANCE WARRANTY

first year. Thereafter max. 0.5% degradation per year. At least 93.5% of nominal power up to 10 years. At least 86 % of nominal power up to

the warranty terms of the Q CELLS



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

TEMPERATURE COEFFICIENTS						
TEMPERATURE COEFFICIENT OF Isc	α	[%/K]	+0.04 TEMPERATURE COEFFICIENT OF Voc	β	[%/K]	-0.27
TEMPERATURE COEFFICIENT OF PMPP	γ	[%/K]	-0.34 NOMINAL 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)	PV module classification	Class II
Maximum Series Fuse Rating	[A DC]	20	Fire Rating based on ANSI / UL 61730	TYPE 2
Max. Design Load, Push / Pull ³	[lbs/ft ²]	75 (3600 Pa) / 55 (2660 Pa)	Permitted Module Temperature	-40°F up to +185°F
Max. Test Load, Push / Pull ³	[lbs/ft ²]	113 (5400 Pa) / 84 (4000 Pa)	on Continuous Duty	(-40°C up to +85°C)

QUALIFICATIONS AND CERTIFICATES











•	
	Horizo
	packa







PACKAGING INFORMATION









UL 61730, CE-compliant



TITAN 525 W Baseline Rd., Mesa, AZ, 85210 TEL: 855.SAY.SOLAR





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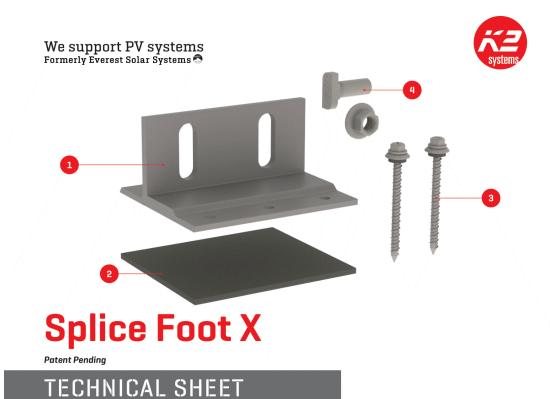
(21) Q PEAK DUO BLK ML G10+ 400W (1) SOLAREDGE SE7600H-US 8.400 kW DC SYSTEM SIZE 7.600 kW AC SYSTEM SIZE

DATE: 3/22/2023

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EQUIPMENT SPECIFICATIONS



Splice Foot X 4000113 | Splice Foot X Kit, Mill K2 FlexFlash Butyl M5 x 60 lag screws T-Bolt & Hex Nut Set

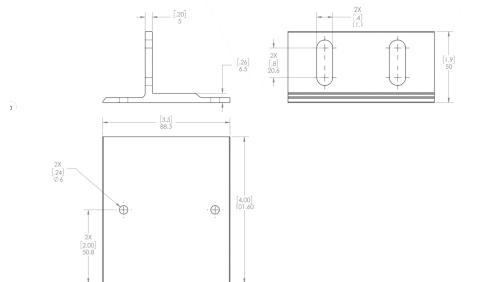
Technical Data

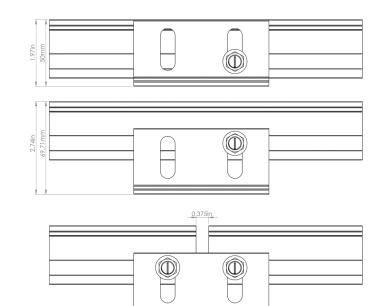
	Splice Foot X	
Roof Type	Composition shingle	
Material	Aluminum with stainless steel hardware	
Finish	Mill	
Roof Connection	M5 x 60 lag screws	
Code Compliance	UL 2703	
Compatibility	CrossRail 44-X, 48-X, 48-XL, 80	

We support PV systems Formerly Everest Solar Systems ♣











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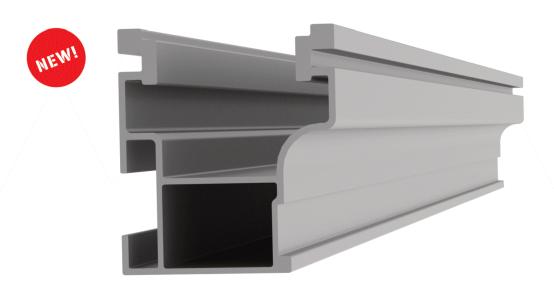
SPECIFICATIONS PV 14

SEAL:

EQUIPMENT

Mounting systems for solar technology





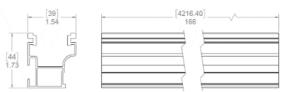
NEW PRODUCT

CrossRail 44-X

- Optimized rail profile
- ▶ One rail for all markets
- ▶ Built-in wire management
- ► Maintains same structural integrity as 48-X
- ▶ Tested up to 200 mph winds
- ▶ Tested up to 100 PSF snow loads



Part Number	Description	
4000019	CrossRail 44-X 166", Mill	
4000020	CrossRail 44-X 166'', Dark	
4000021	CrossRail 44-X 180", Mill	
4000022	CrossRail 44-X 180", Dark	
4000051	RailConn Set, CR 44-X, Mill	
4000052	RailConn Set, CR 44-X, Dark	
4000067	End Cap, Black, CR 44-X	



www.everest-solarsystems.com

CrossRail 44-X Product Sheet US01 | 0520 · Subject to change · Product illustrations are exemplary and may differ from the original.



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12 NEWHOPE CT , CAMERON, NC, 28326
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DATE: 3/22/2023

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DRAWN BY: CA

EQUIPMENT SPECIFICATIONS PV 15



Recommended OCPD Size per Grid

Inverter	Maximum Output Current (A)	Minimum Fuse Rating (A)	Maximum Fuse Rating (A)
SE3000H-US	12.5	20	50
SE3800H-US	16	20	50
SE5000H-US	24 @ 208V	30	50
	21 @ 240V		
SE6000H-US	24 @ 208V	30 @ 208V	50
	25 @ 240V	35 @ 240V	
SE7600H-US	32	40	50
SE10000H-US	42	60	80
SE11400H-US	48.5 @ 208V	70 @ 208V	80
	47.5 @ 240V	60 @ 240V	

SolarEdge Single Phase Inverter with HD-Wave Technology Installation MAN-01-00541-1.1



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(21) Q PEAK DUO BLK ML G10+ 400W (1) SOLAREDGE SE7600H-US 8.400 kW DC SYSTEM SIZE 7.600 kW AC SYSTEM SIZE

DATE: 3/22/2023

REV: A DRAWN BY: CA equipment specifications PV 16