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)

GENERAL INFORMATION

8.400 kW-DC-STC SYSTEM SIZE:

7.600 kW-AC

40 DEGREES ROOF PITCHED:

INVERTER: (1) SOLAREDGE SE7600H-US W/ P401 OPTIMIZERS

MODULES: (21) Q PEAK DUO BLK ML G10+ 400W (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

ROOF FRAMING: MANUFACTURED/ENGINEERED TRUSS

RACKING: K2 SYSTEMS

ATTACHMENT METHOD: MIN. 5/16" x 3 1/2 LAG SCREWS EA. STANDOFF

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RACKING LOAD & UPLIFT CALCULATIONS	PV LAYOUT	PV 3
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ELECTRICAL 3 LINE DIAGRAM	THREE LINE	PV 6
OCP & WIRE SIZING CALCULATIONS	1 & 3 LINE	PV 5 & 6
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PV EQUIPMENT LABELING DETAIL	LABELS	PV 7
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DATA SHEETS & ADDITIONAL INFORMATION	SUPPLEMENTAL MATERIAL	

AERIAL MAP

SCALE: NTS





Wyssling Consulting, PLLC 76 N Meadowbrook Drive Alpine UT 84004 North Carolina COA # P-2308

Signed 12/12/2022

DOCUMENT ARE NOT CONSIDERED SIGNED AND SEALED AND THE SIGNATURE MUST BE VERIFIED ON ANY ELECTRONIC COPIES

NOTES

SCALE: NTS

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.

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
- 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

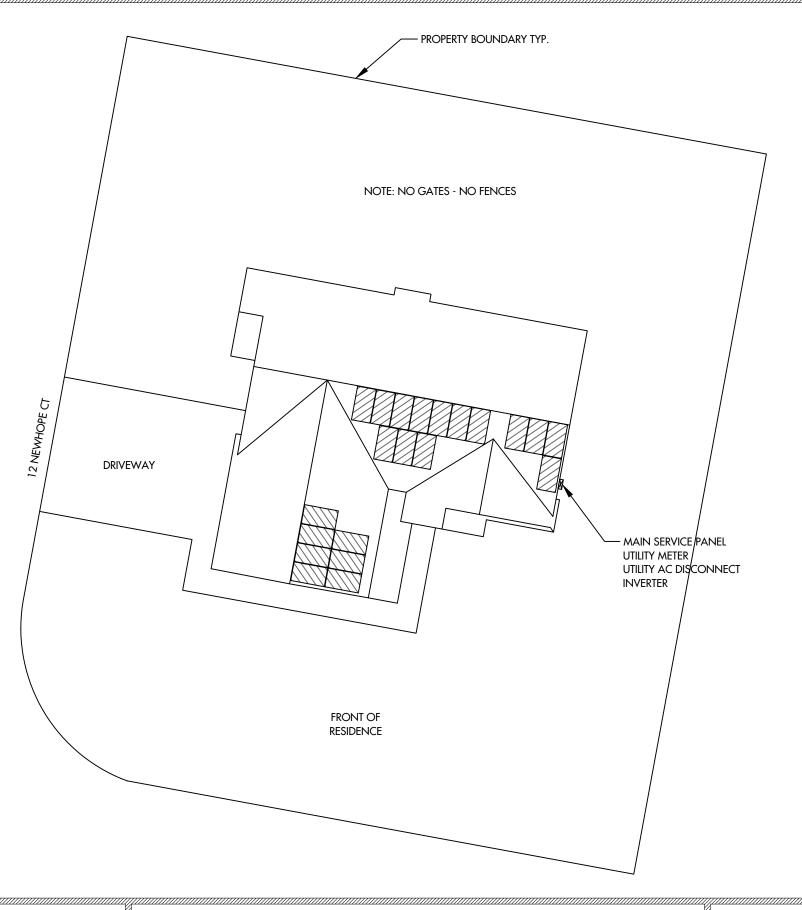
(21) Q PEAK DUO BLK ML G10+ 400W (1) SOLAREDGE SE7600H-US 8.400 kW DC SYSTEM SIZE 7.600 kW AC SYSTEM SIZE

DATE: 12/12/2022 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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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

SCALE: 15/256" = 1'-0" DATE: 12/12/2022

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

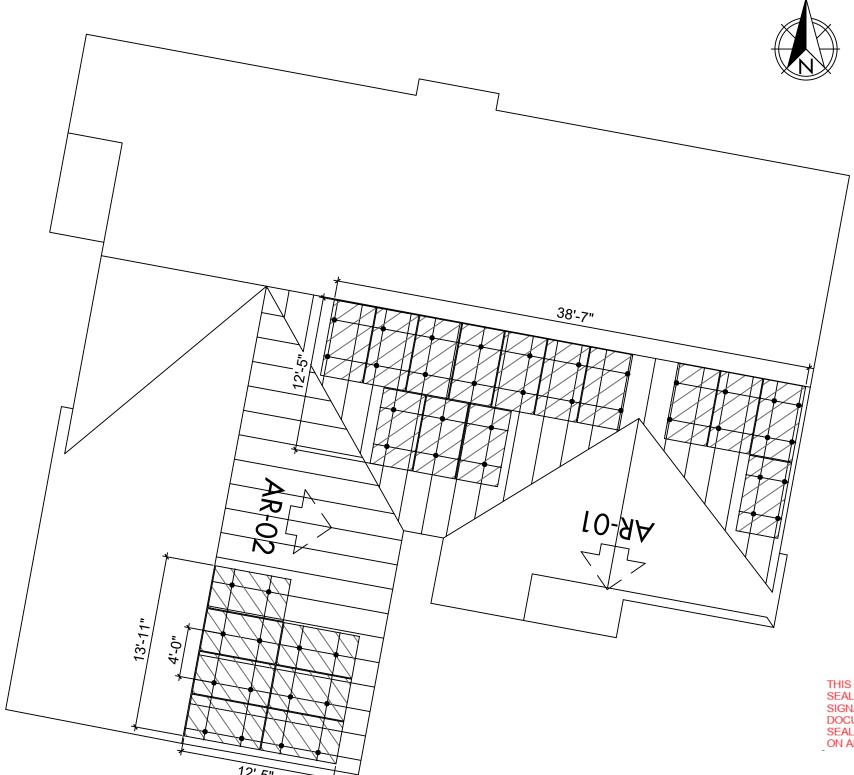
AR-02

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: 12/12/2022

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

 $\underline{PULLOUT\ STRENGTH} = \underline{14700.00\ LBS}.$

DISTRIBUTED LOAD = 2.46 PSF

MODULE & RACKING WEIGHT = 728.00 LBS

ARRAY 02: 7 MODULES

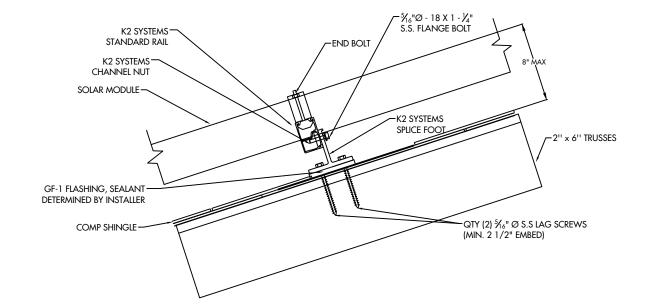
UPLIFT = 4435.38 LBS.

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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(1) SOLAREDGE SE7600H-US
8.400 kW DC SYSTEM SIZE
7.600 kW AC SYSTEM SIZE

DATE: 12/12/2022

REV:A

DRAWN BY: CA

DETAILS

PV 4

PV MODULE

Q PEAK DUO BLK ML G10+ 400W

W = 400 WISC = 11.14 ADC VOC = 45.30 VDC

IMP = 10.77 ADC VMP = 37.13 VDC $TVOC = -0.270\% / ^{\circ}C$

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)

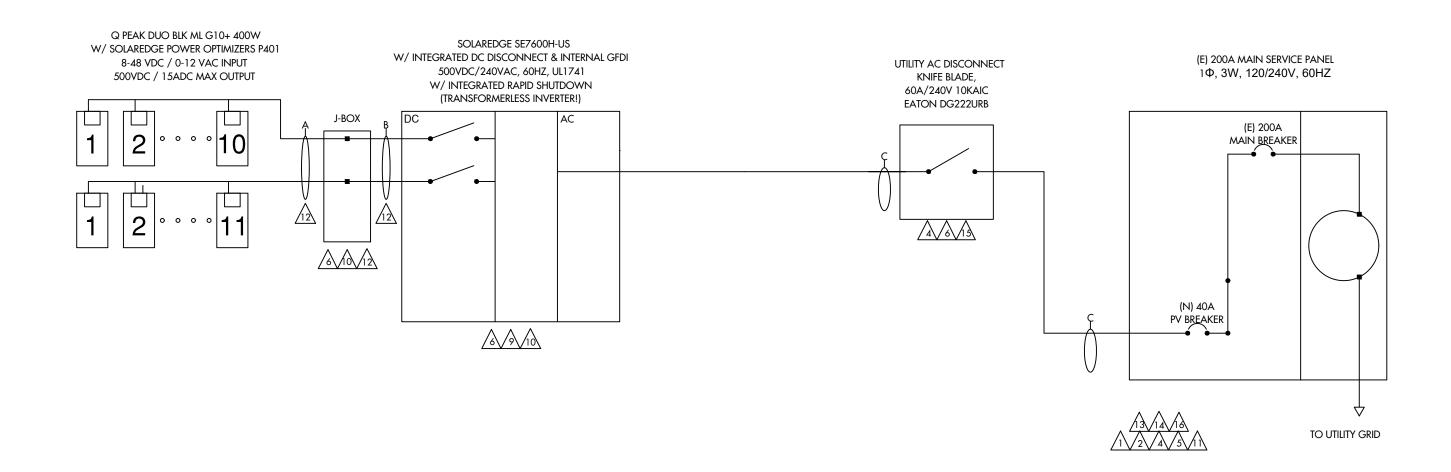
3/4" EMT

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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DATE: 12/12/2022

REV:A

DRAWN BY: CA

ONE LINE

PV 5

J. |

PV MODULE

TVOC =

Q PEAK DUO BLK ML G10+ 400W

-0.270% / °C

W = 400 W ISC = 11.14 ADC

VOC = 45.30 VDC IMP = 10.77 ADC VMP = 37.13 VDC 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)

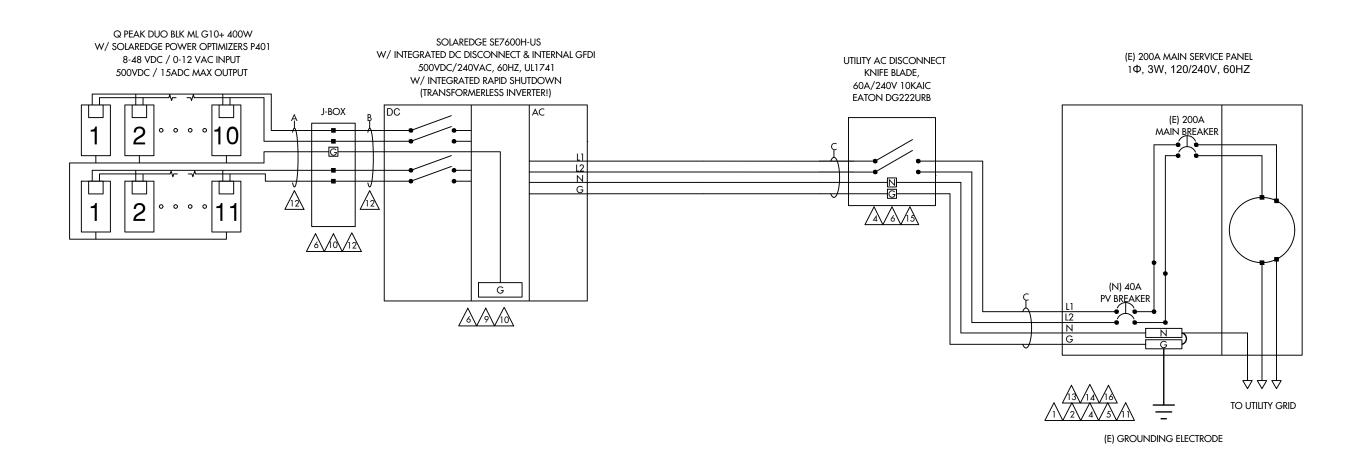
3/4" EMT

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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DATE: 12/12/2022

REV:A

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THREE LINE

PV 6





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)



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

LOCATION: DEDICATED KWH METER

CODE REF: NEC 690.4(B) UTILITY



/10\

MARNING

PHOTOVOLTAIC SYSTEM **COMBINER PANEL**

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

TURN RAPID SHUTDOWN

POSITION TO SHUT DOWN

PV SYSTEM AND REDUCE SHOCK HAZARD IN THE ARRAY.

SOLAR PV SYSTEM EQUIPPED

WITH RAPID SHUTDOWN

DO NOT ADD LOADS

PHOTOVOLTAIC SYSTEM DC DISCONNECT

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)



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

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

LOCATION: MAIN SERVICE (OUTSIDE COVER)

NEC 690.56(C)(1)(a

CODE REF: NEC 690.12

YELLOW STICKER

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.



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DATE: 12/12/2022

REV: A

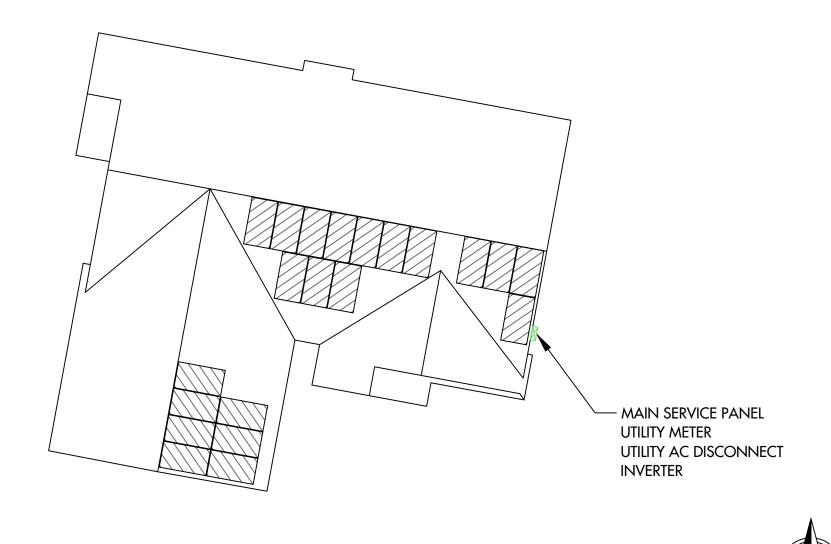
DRAWN BY: CA

LABELS

PV 7

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

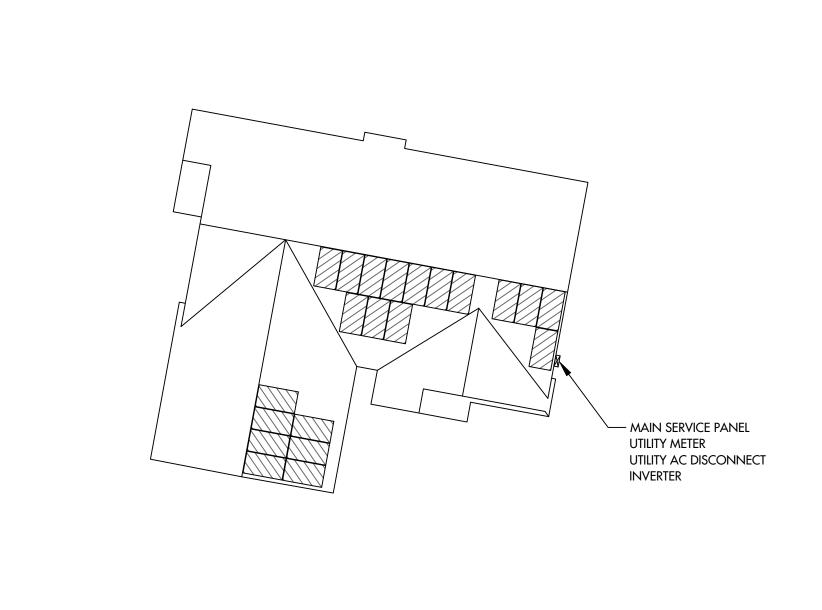


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(1) SOLAREDGE SE7600H-US
8.400 kW DC SYSTEM SIZE
7.600 kW AC SYSTEM SIZE

DATE: 12/12/2022 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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DATE: 12/12/2022

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	А	
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	(Yes					
Maximum Input Voltage				480				Vd	
Nominal DC Input Voltage			380			400		Vd	
Maximum Input Current @240V ⁽²⁾	8.5	10.5	13.5	16.5	20	27	30.5	Ad	
Maximum Input Current @208V ^[2]	-	9	-	13.5	-	-	27	Ad	
Max. Input Short Circuit Current				45				Ad	
Reverse-Polarity Protection	3			Yes					
Ground-Fault Isolation Detection				600kΩ Sensitivity					
Maximum Inverter Efficiency	99			g	9.2			98	
CEC Weighted Efficiency		99 @ 240V 99 98.5 @ 208V							
Nighttime Power Consumption				< 2.5				W	

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

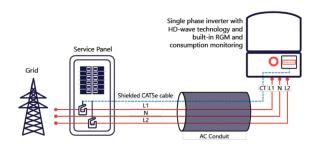
SE3000H-US / SE3800H-US / SE5000H-US / SE6000H-US/ SE7600H-US / SE10000H-US / SE11400H-US

MODEL NUMBER	SE3000H-US	E3800H-US	SE5000H-US	SE6000H-US	SE7600H-US	SE10000H-US	SE11400H-US	
ADDITIONAL FEATURES								
Supported Communication Interfaces			RS485, Ethernet, 2	ZigBee (optional), (Cellular (optional)			
Revenue Grade Metering, ANSI C12.20				Optional ⁽³⁾				
Consumption metering				Α΄.				
Inverter Commissioning		With the Set/	App mobile application	using Built-in Wi-F	i Access Point for Lo	ical Connection		
Rapid Shutdown - NEC 2014 and 2017 690.12		Automatic Rapid Shutdown upon AC Grid Disconnect						
STANDARD COMPLIANCE								
Safety		UL1741, UL1741 SA, UL1699B, CSA C22.2, Canadian AFCI according to T.I.L. M-07						
Grid Connection Standards			IEEE15	547, Rule 21, Rule 1	4 (HI)			
Emissions				FCC Part 15 Class B				
INSTALLATION SPECIFICAT	IONS							
AC Output Conduit Size / AWG Range		1"	Maximum / 14-6 AWG	i		1" Maximum	/14-4 AWG	
DC Input Conduit Size / # of Strings / AWG Range		1" Maxir	num / 1-2 strings / 14-6	5 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	c 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	Natural Convection	1			
Operating Temperature Range			-40	to +140 / -40 to +	60 ⁽⁴⁾			°F/°C
Protection Rating		NEMA 4X (Inverter with Safety Switch)						

erter with Revenue Grade Meter P/N. 56:000A1-050U0BNL-9; inverter with Revenue Grade Produld 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, homeon household energy usage helping them to avoid high electricity bills





solaredge

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: 12/12/2022 REV: A

DRAWN BY: CA

EQUIPMENT SPECIFICATIONS PV 10

CONTRACTOR LIC# U.34445



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
- 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

(2) 1 -PH Inverters

SE3000A-US / SE3800A-US / SE5000A-US / SE6000A-US / SE7600A-US / SE10000A-US / SE11400A-US / SE3000H-US / SE3800H-US / SE5000H-US / SE6000H-US / SE7600H-US / SE10000H-US / SE11400H-US when the following label is labeled on the side of the inverter:

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 / SE43.2KUS / 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 is 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. 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 Incitation 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"



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EQUIPMENT SPECIFICATIONS

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



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	NVERTER 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		0 - 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 De: a SolarEdge Ir	sign Using nverter ⁽⁶⁾⁽⁷⁾	Single Phase HD-Wave	Single phase	Three Phase for 208V grid	Three Phase for 277/480V grid	
Minimum String Length	P320, P340, P370, P400, P401	8	1	10	18	
(Power Optimizers)	P405, P485, P505	6		8	14	
Maximum String Length (Power	Optimizers)	2.	5	25	50 ⁽⁸⁾	
Maximum Power per String		5700 (6000 with SE7600-US - SE11400- US)	5250	6000%	12750(10)	W
Parallel Strings of Different Leng	ths or Orientations		,	/es		

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

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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



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.

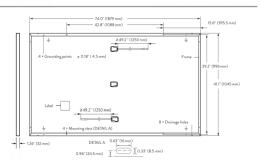
Q PEAK DUO BLK ML-G10+

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

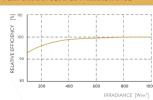
POV	VER CLASS			385	390	395	400	405
MIN	IIMUM PERFORMANCE AT STANDARD	rest conditions	, STC 1 (PC	OWER TOLERANCE +5	W / -0 W)			
	POWER AT MPP	P _{MPP}	[W]	385	390	395	400	405
₹	SHORT CIRCUIT CURRENT	I _{sc}	[A]	11.04	11.07	11.10	11.14	11.17
3	OPEN CIRCUIT VOLTAGE	V _{oc}	[V]	45.19	45.23	45.27	45.30	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)

EMPERATURE 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







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CERTIFIED	р

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ED	pack

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PACKAGING INFORMATION







UL 61730, CE-compliant







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

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EQUIPMENT SPECIFICATIONS



TECHNICAL SHEET

Item Number	Description	Part Number
1	Splice Foot X	4000113 Splice Foot X Kit, Mill
2	K2 FlexFlash Butyl	
3	M5 x 60 lag screws	
4	T-Bolt & Hex Nut Set	

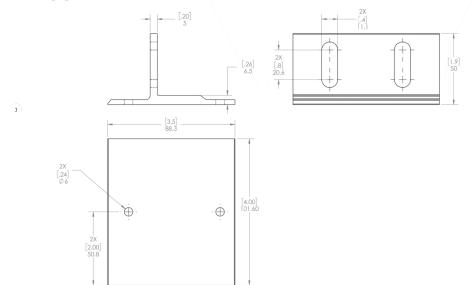
Technical Data

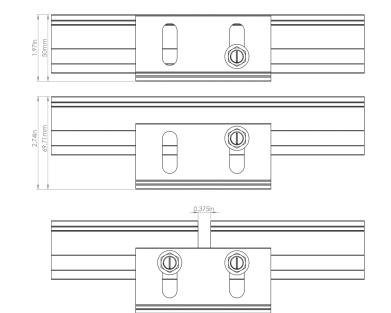
	Splice Foot X
Roof Type	Composition shingle
Material	Aluminum with stainless steel hardware
Finish	Mill
Roof Connection	M5 x 60 lag screws
Code Compliance	UL 2703
Compatibility	CrossRail 44-X, 48-X, 48-XL, 80

We support PV systems
Formerly Everest Solar Systems



Units: [in] mm





Iro arratama sam



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

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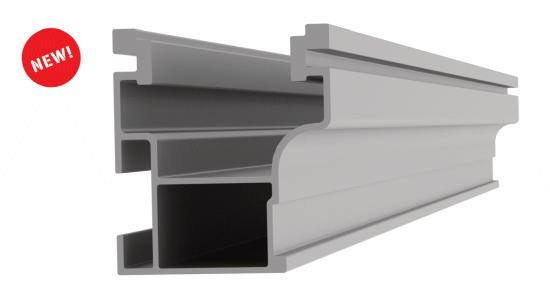
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EQUIPMENT SPECIFICATIONS PV 14

Mounting systems for solar technology





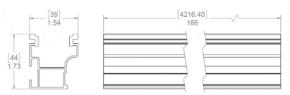
NEW PRODUCT

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.



LAWRENCE, DARRELL RESIDENCE
12 NEWHOPE CT , CAMERON, NC, 28326
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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	20	50
	21 @ 240V	30	50
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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EQUIPMENT SPECIFICATIONS PV 16