

PROJECT DETAILS	
PV Modules	23 x Q.PEAK DUO BLK G6+ 340
Optimizers	23 x P340
Inverter	1 x SE7600H-US(RGM)
Roof Type	Asphalt Shingles
Racking	IronRidge XR10
Mounting Type	Flashfoot2
DC SIZE	7.82 kW
AC SIZE	7.6 kVA

DRAWING INDEX			
Item	Drawing #	Rev	Description
1	20294TR00-0	A	Drawing Index
2	20294TR00-1	A	Site Layout
3	20294TR00-2	A	String Mapping
4	20294TR00-3	A	Electrical One Line Diagram
5	20294TR00-4	A	Detailed Electrical Wiring Schematic
6	20294TR00-5	A	PV Labels
7	20294TR00-6	A	Bill of Materials



Tomas Ramos
 44 Skycroft Dr,
 Sanford, NC 27332



1	11/24/2020	A

JOB NUMBER 20-294-TR00
 DATE ISSUED 11/24/2020
 PROJECT STATUS PERMITTING

SHEET
DRAWING INDEX

TR
 20294TR00-0

TOP VIEW OF BUILDING



FRONT VIEW OF BUILDING



DRAWING INDEX
 SCALE: NTS



PV System Dead Load
(Panel + Racking weight) / PV System Area
 (23 modules x 43.9 lbs./panel + 199 ft. of racking x 1.15 lb.ft) /
 (23 panels x 68.5" x 40.6") = 2.79 psf

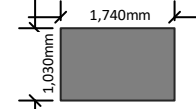
The roof is located in 116mph wind zone

There is one layer of shingles
 Roofing material is asphalt shingles



Utility
Meter

Module
Dimension

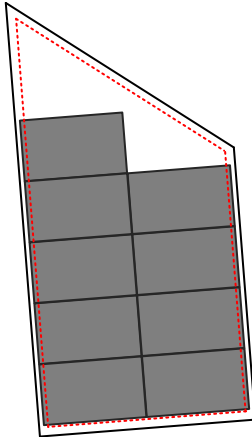


Roofs	Pitch	Azimuth
A & B	35°	175°
C & D	45°	265°
E	27°	265°

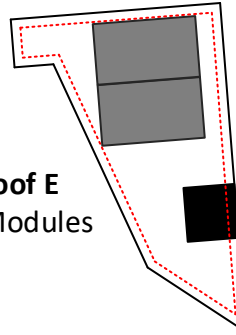
SYSTEM DETAILS

NUMBER OF PANELS : 23
 PANELS MODEL : Q,PEAK DUO BLK G6+ 340
 DC SIZE : 7.82 kW
 AC SIZE : 7.6 kVA

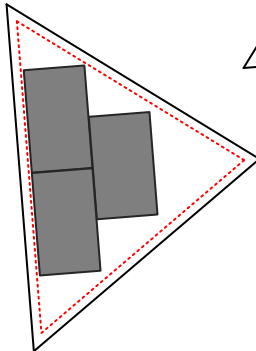
Roof D
09 Modules



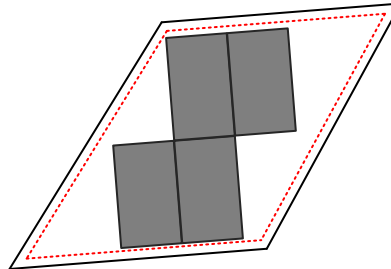
Roof E
02 Modules



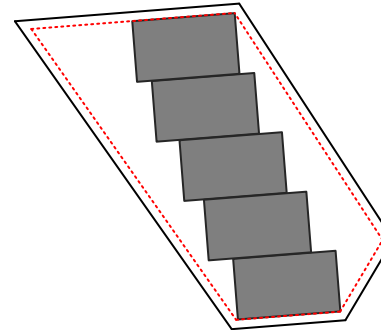
Roof C
03 Modules



Roof B
04 Modules



Roof A
05 Modules



6" clearance
from each side
of the roof

SITE LAYOUT

SCALE: 3/32" - 1' 0"



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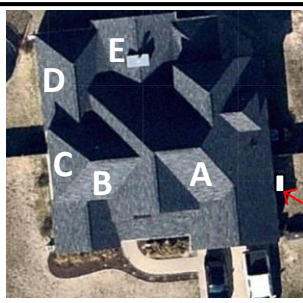
DATE ISSUED
11/24/2020

PROJECT STATUS
PERMITTING

SHEET
SITE LAYOUT

TR
20294TR00-1

String Layout					
Inverter SE7600H-US(RGM)					
Strings #	No. of Modules	Color Code	Strings #	No. of Modules	Color Code
String A	14				
String B	09				

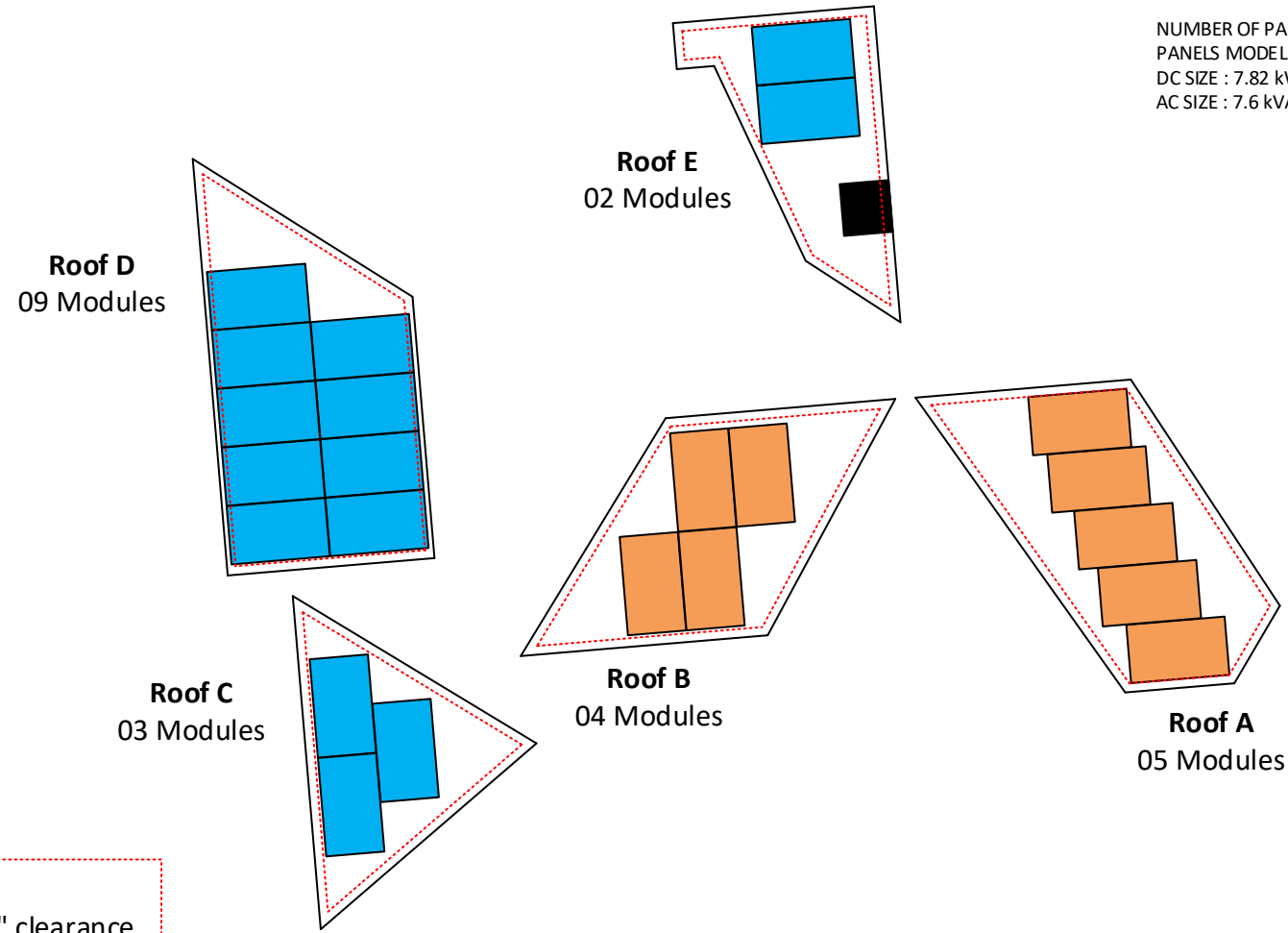


Module Dimension		
	Pitch	Azimuth
Roofs		
A & B	35°	175°
C & D	45°	265°
E	27°	265°

8MSOLAR
ADVANCING ENERGY INDEPENDENCE
 101 Woodwinds Industrial Ct, Ste O
 Cary, NC 27511
 O: 919.948.6474
 E: info@8msolar.com

SYSTEM DETAILS

NUMBER OF PANELS : 23
 PANELS MODEL : Q,PEAK DUO BLK G6+ 340
 DC SIZE : 7.82 kW
 AC SIZE : 7.6 kVA



6" clearance from each side of the roof

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NABCEP CERTIFIED
 PV Installation Professional
 Ali Buttar
 PVIP #031310-32

1	11/24/2020	A

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 20-294-TR00
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SHEET
STRING MAPPING

STRING MAPPING
 SCALE: 3/32" - 1' 0"



TR
 20294TR00-2

SOLAREEDGE
SE7600H-US (RGM)
INVERTER RATING 7600W
UL 1741 Listed

(4) #10 THWN Cu
3/4" EMT AS EGC
NEC 250.118 (4)

J.Box

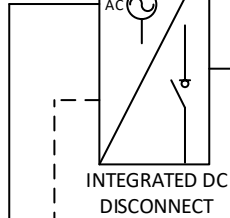
(4) #10 PV WIRE
(1) #6 BARE COPPER
3/4" EMT

23 x Q.PEAK DUO BLK G6+ 340
340W
SOLAREEDGE P340 OPTIMIZER
RAPID SHUTDOWN EQUIPPED

String A

String B

INTEGRATED DC
DISCONNECT



(3) #08 THWN Cu
(1) #10 GREEN
1" LFNC

60A AC DISCONNECT
NON FUSIBLE

SHIELDED CAT5E CABLE
WILL BE USED TO
CONNECT THE CT'S

CT's WILL BE INSTALLED
UPSTREAM OF 200A BREAKER

CONNECTION SHALL BE MADE BY
USING 40A BREAKER INSIDE THE
MAIN LOAD PANEL

MAIN LOAD PANEL
M.B RATING: 200A

UTILITY METER

FROM UTILITY

ELECTRICAL NOTES

- System Size: 7.82 W DC
- (23) Q.PEAK DUO BLK G6+ 340
- (23) SOLAREEDGE P340 OPTIMIZERS
- (01) SOLAREEDGE SE7600H-US
- Inverter Output: 32A max @ 240 VAC
- 7.6 kVA AC output max

STRING A:
14 X 340W = 4,760W ea
I_{mpp} = 11.9 A_{dc}
I_{max} = 23.4 A_{dc}
V_{mpp} = 400 V_{dc}
V_{oc} = 14 V_{dc}

STRING B:
09 X 340W = 3,060W ea
I_{mpp} = 7.65 A_{dc}
I_{max} = 23.4 A_{dc}
V_{mpp} = 400 V_{dc}
V_{oc} = 09 V_{dc}

EGC – EQUIPMENT GROUNDING CONDUCTOR
EMT IS GROUND, NO SEPARATE WIRE NEEDED AS
GROUNDING CONDUCTOR

- Grounding will be done via IronRidge grounding mid-clamps and WEEB bonding jumpers to ensure the rail and panels are continuously grounded.
- Rapid Shutdown is included in the Inverter, refer to inverter & optimizer attached datasheets.
- The load center / disconnect will be visible, lockable accessible to utility linesmen and will be properly labelled as per NEC requirements. It will be located on the exterior wall of the building, next to the utility meter.

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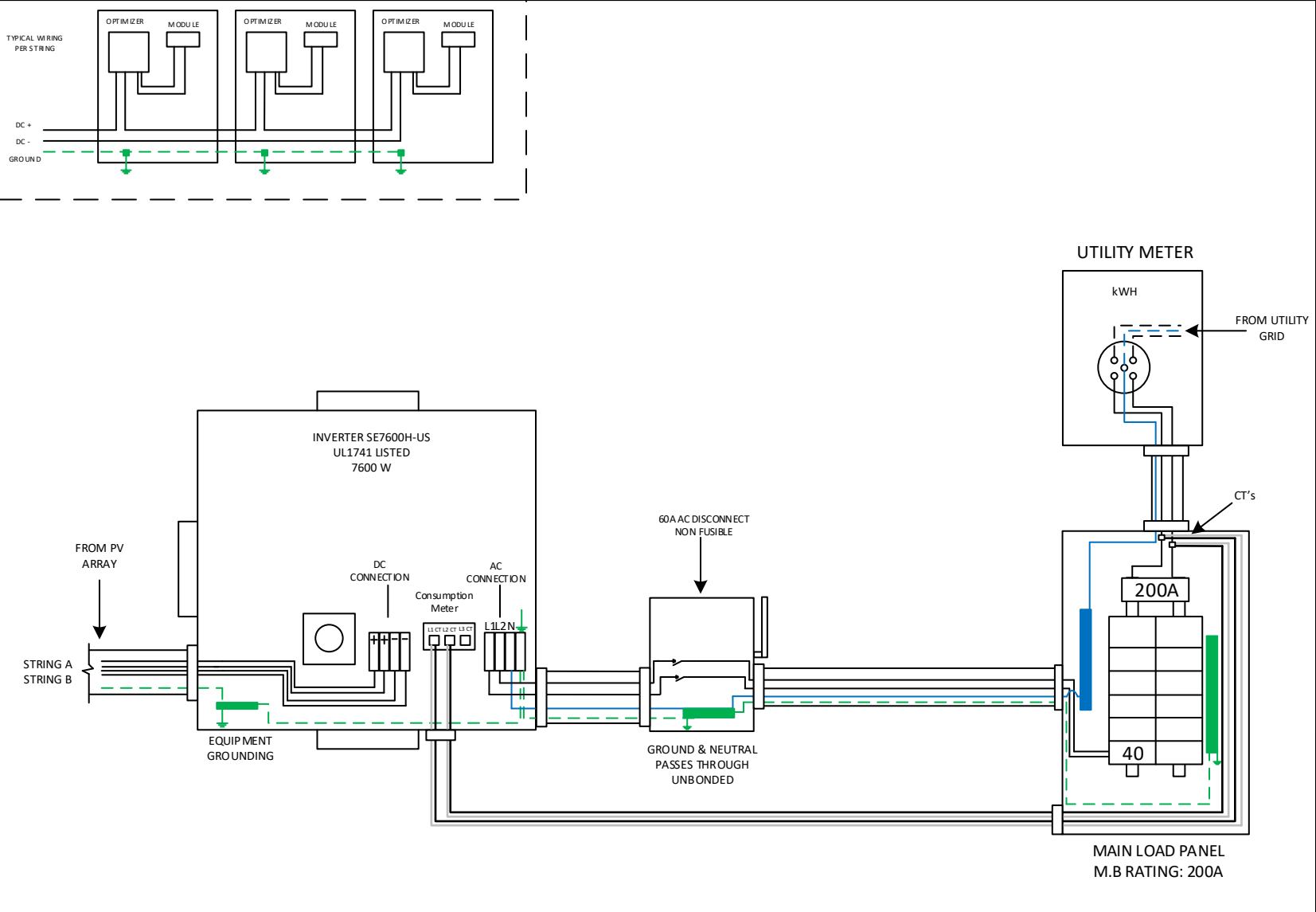


1	11/24/2020	A

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PERMITTING

SHEET
**ELECTRICAL ONE LINE
DIAGRAM**

TR
20294TR00-3



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PV Installation Professional
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 PVIP #031310-32

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SHEET
DETAILED ELECTRICAL WIRING SCHEMATIC

TR
 20294TR00-4

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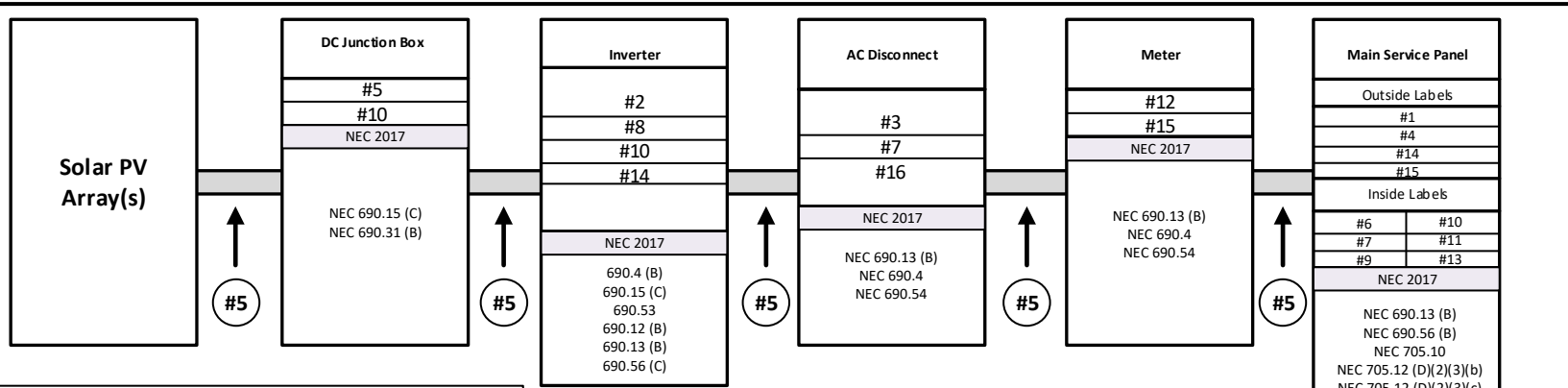


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SHEET
PV LABELS

TR
20294TR00-5



LABELING AND WARNING SIGNS

A. PURPOSE
PROVIDE EMERGENCY RESPONDERS WITH APPROPRIATE WARNING AND GUIDANCE WITH RESPECT TO ISOLATING THE SOLAR ELECTRIC SYSTEM. THIS CAN FACILITATE IDENTIFYING ENLARGED ELECTRICAL LINES THAT CONNECT THE SOLAR PANELS TO THE INVERTER, AS SHOULD NOT BE CUT WHEN VENTING FOR SMOKE REMOVAL.

B. MAIN SERVICE DISCONNECT:

- RESIDENTIAL BUILDINGS- THE MARKING MAY BE PLACED WITHIN THE MAIN SERVICE DISCONNECT. THE MARKING SHALL BE PLACED ON THE OUTSIDE COVER IF THE MAIN SERVICE DISCONNECT IS OPERABLE WITH THE SERVICE PANEL CLOSED.
- COMMERCIAL BUILDINGS- THE MARKINGS SHALL BE PLACED ADJACENT TO THE MAIN SERVICE DISCONNECT CLEARLY VISIBLE FROM THE LOCATION WHERE THE LEVER IS OPERATED

3. MARKINGS, VERBIAGE, FORMAT AND TYPE OF MATERIAL

- VERBIAGE: CAUTION; SOLAR ELECTRIC SYSTEM CONNECTED
- FORMAT:
 - WHITE LETTERING ON A RED BACKGROUND
 - MINIMUM 3/8 INCH LETTER HEIGHT
 - ALL LETTERS SHALL BE CAPITALIZED
 - ARIAL OR SIMILAR FONT, NON-BOLD

c. MATERIAL:

- REFLECTIVE, WEATHER RESISTANT MATERIAL SUITABLE FOR THE ENVIRONMENT (USE UL-969) AS STANDARD FOR WEATHER RATING); DURABLE ADHESIVE MATERIALS MEET THIS REQUIREMENT.

C. MARKING REQUIREMENTS ON DC CONDUIT, RACEWAYS, ENCLOSURES, CABLE ASSEMBLIES, DC COMBINERS AND JUNCTION BOXES:

- MARKING: PLACEMENT, VERBIAGE, FORMAT AND TYPE OF MATERIAL.
 - PLACEMENT: MARKINGS SHALL BE PLACED EVERY 10 (TEN) FEET ON ALL INTERIOR AND EXTERIOR DC CONDUITS, RACEWAYS, ENCLOSURES AND CABLE ASSEMBLIES, AT TURNS ABOVE AND/OR BELOW PENETRATIONS, ALL DC COMBINERS AND JUNCTION BOXES.
 - VERBIAGE: CAUTION SOLAR CIRCUIT
 - THE FORMAT AND TYPE OF MATERIAL SHALL ADHERE TO SECTION B-3.B & C ABOVE

D. INVERTERS ARE NOT REQUIRED TO HAVE CAUTION MARKINGS

#1 

#2 

#3 

#4 

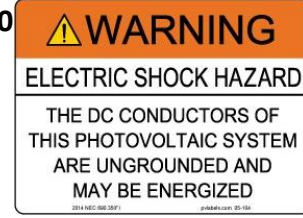
#5 

#6 

#7 

#8 

#9 

#10 

#11 

#12 

#13 

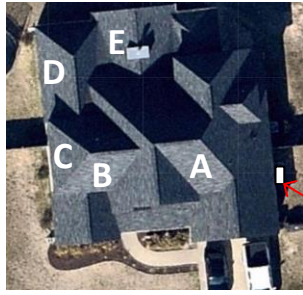
#14 

#15 

#16 

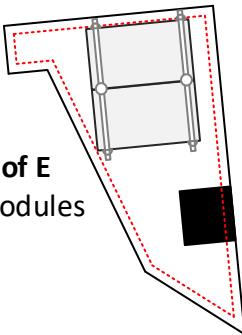
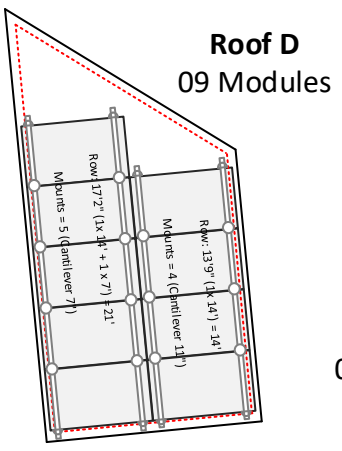
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Rails and Splices : XR10	Roof Attachment : Flashfoot2
Rafter Spacing : 16 in	There is one layer of shingles Roofing material is asphalt shingles
Attachment Span: 4ft	The roof is located in 116mph wind zone

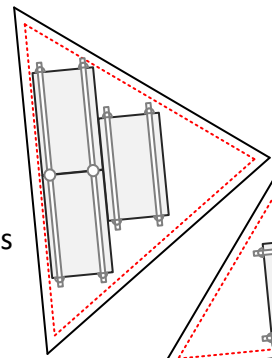


Module Dimension		
	Roofs	Pitch
A & B	35°	175°
C & D	45°	265°
E	27°	265°

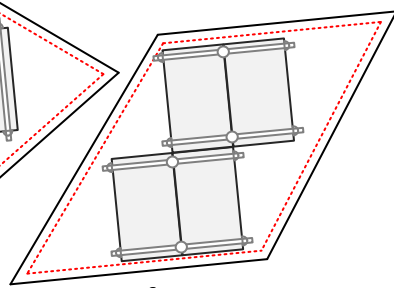
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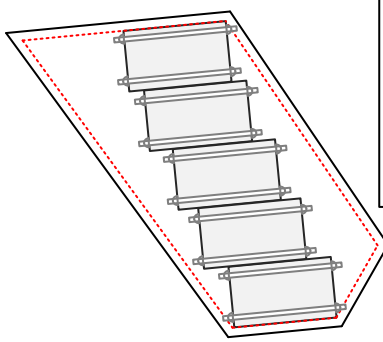
Roof E
02 Modules



Roof C
03 Modules



Roof B
04 Modules



Roof A
05 Modules

6" clearance from each side of the roof

Row: 5' 11" (1 x 7') = 7'	
Mounts = 02 (Cantilever 11")	
Cut one 14' rail into half and use	

Row: 11' 7" (1 x 14') = 14'	
Mounts = 03 (Cantilever 1'10")	

Row: 6' 11" (1 x 8') = 8'	
Mounts = 02 (Cantilever 1'6")	
Cut one 17' rail into half and use	

- RAILS AND SPLICES**
- 03 x XR-10-204B: XR10, Rail 204" (17 Feet) Black
 - 13 x XR-10-168B: XR10, Rail 168" (14 Feet) Black
 - 02 x XR-10-SPLC-M1: XR10 Bonded Splice (Incl. Self-tapping Screws)
- CLAMPS & GROUNDING**
- 22 x UFO-CL-01-B1: Universal Module Clamp, Black
 - 48 x CAMO-01-M1: Hidden End Cam (universal clamp)
 - 14 x XR-LUG-03-A1: Grounding Lug, Low Profile
- ATTACHMENTS**
- 60 x FF2-01-M2: FlashFoot2, Mill
 - 60 x BHW-SQ-02-A1: Square-Bolt Bonding Hardware
- ACCESSORIES**
- 03 x XR-10-CAP: Kit, End Cap XR10 (10 sets per bag)
 - 23 x BHW-MI-01-A1: Microinverter Bonding Hardware, T-Bolt

- SOLAR MODULES**
- 23 x Q,PEAK DUO BLK G6+ 340
- INVERTER & SUPPORTING ITEMS**
- 01 x SolarEdge SE7600H-US (with Cons. Meter SE7600H-US000BN14)
 - 23 x SolarEdge Power Optimizer P340
 - 02 x 200A SolarEdge CTs
 - 01 x PV Labels Kit
 - 01 x ZigBee
- WIRE & DISCONNECTS**
- 500 ft x PV WIRE BLK (Cu)

NABCEP CERTIFIED
PV Installation Professional
Ali Buttar
PVIP #031310-32

1	11/24/2020	A

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SHEET
BILL OF MATERIAL

TR
20294TR00-6

BILL OF MATERIAL
SCALE: 3/32" - 1' 0"

Q.PEAK DUO BLK-G6+ 330-345

ENDURING HIGH
PERFORMANCE



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 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.



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, 168h)

² See data sheet on rear for further information

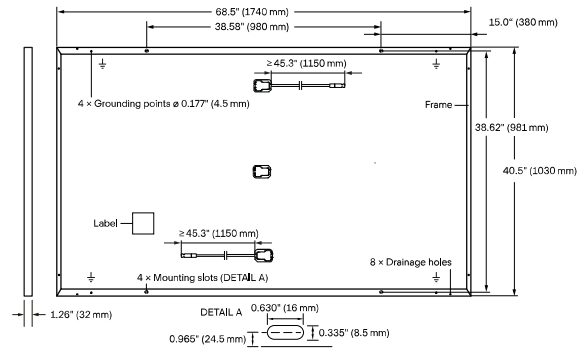
THE IDEAL SOLUTION FOR:



Rooftop arrays on
residential buildings

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 mm ² 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

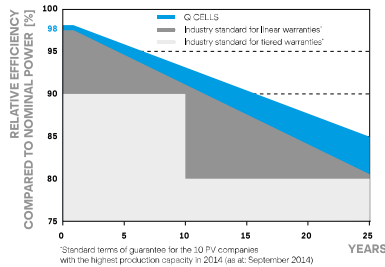


ELECTRICAL CHARACTERISTICS

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

¹Measurement 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 • *800 W/m², NMOT, spectrum AM 1.5

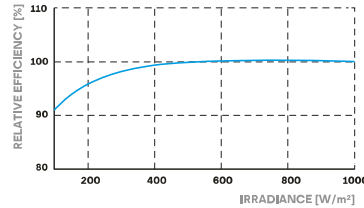
Q CELLS PERFORMANCE WARRANTY



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 / ft ²]	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 / ft ²]	113 (5400 Pa) / 84 (4000 Pa)		

³See 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.

Hanwha Q CELLS America Inc.

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 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
- // Record-breaking 99% weighted efficiency
- // Quick and easy inverter commissioning directly from a smartphone using the SolarEdge SetApp
- // Fixed voltage inverter for longer strings
- // Integrated arc fault protection and rapid shutdown for NEC 2014 and 2017, per article 690.11 and 690.12
- // UL1741 SA certified, for CPUC Rule 21 grid compliance
- // 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 Min.-Nom.-Max. (211 - 240 - 264)	✓	✓	✓	✓	✓	✓	✓	Vac
AC Output Voltage Min.-Nom.-Max. (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	A
Maximum Continuous Output Current @208V	-	16	-	24	-	-	48.5	A
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							Vdc
Nominal DC Input Voltage	380				400			Vdc
Maximum Input Current @240V ⁽²⁾	8.5	10.5	13.5	16.5	20	27	30.5	Adc
Maximum Input Current @208V ⁽²⁾	-	9	-	13.5	-	-	27	Adc
Max. Input Short Circuit Current	45							Adc
Reverse-Polarity Protection	Yes							
Ground-Fault Isolation Detection	600k Ω Sensitivity							
Maximum Inverter Efficiency	99	99.2						%
CEC Weighted Efficiency	99						99 @ 240V 98.5 @ 208V	%
Nighttime Power Consumption	< 2.5							W

⁽¹⁾ For other regional settings please contact SolarEdge support

⁽²⁾ A higher current source may be used; the inverter will limit its input current to the values stated

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

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

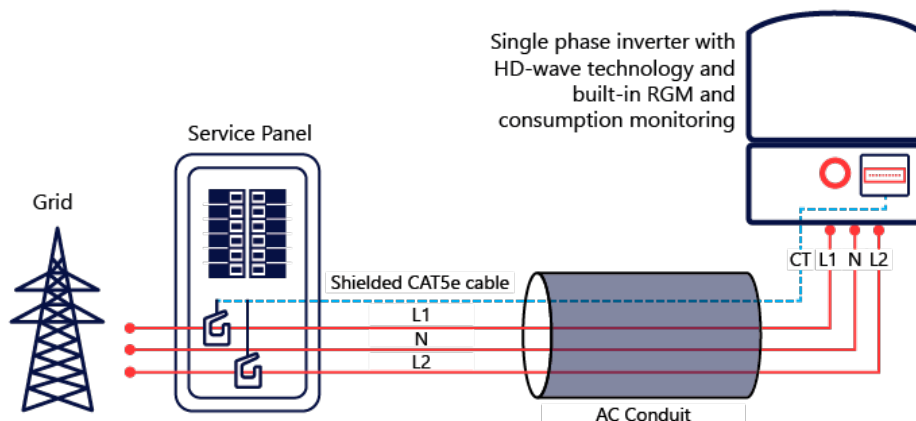
MODEL NUMBER	SE3000H-US	SE3800H-US	SE5000H-US	SE6000H-US	SE7600H-US	SE10000H-US	SE11400H-US		
ADDITIONAL FEATURES									
Supported Communication Interfaces	RS485, Ethernet, ZigBee (optional), Cellular (optional)								
Revenue Grade Metering, ANSI C12.20	Optional ⁽³⁾								
Consumption metering									
Inverter Commissioning	With the SetApp mobile application using Built-in Wi-Fi Access Point for Local 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	IEEE1547, Rule 21, Rule 14 (HI)								
Emissions	FCC Part 15 Class B								
INSTALLATION SPECIFICATIONS									
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	Natural Convection								
Operating Temperature Range	-40 to +140 / -40 to +60 ⁽⁴⁾								°F / °C
Protection Rating	NEMA 4X (Inverter with Safety Switch)								

⁽³⁾ Inverter with Revenue Grade Meter P/N: SExxxxH-US000BNC4; Inverter with Revenue Grade Production and Consumption Meter P/N: SExxxxH-US000BN14 . For consumption metering, current transformers should be ordered separately: SEACT0750-200NA-20 or SEACT0750-400NA-20. 20 units per box

⁽⁴⁾ 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>

How to Enable Consumption Monitoring

By simply wiring current transformers through the inverter's existing AC conduits and connecting them to the service panel, homeowners will gain full insight into their household energy usage helping them to avoid high electricity bills



Power Optimizer

For North America

P320 / P340 / P370 / P400 / P401 / P405 / P485 / 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

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 ⁽¹⁾	320	340	370	400		405	485	505	W	
Absolute Maximum Input Voltage (Voc at lowest temperature)	48		60	80	60	125 ⁽²⁾		83 ⁽²⁾	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	11		14	Adc	
Maximum DC Input Current	13.75			12.5	14.65	12.5		17.5	Adc	
Maximum Efficiency	99.5								%	
Weighted Efficiency	98.8							98.6	%	
Overvoltage Category	II									
OUTPUT DURING OPERATION (POWER OPTIMIZER CONNECTED TO OPERATING SOLAREEDGE INVERTER)										
Maximum Output Current	15								Adc	
Maximum Output Voltage	60					85			Vdc	
OUTPUT DURING STANDBY (POWER OPTIMIZER DISCONNECTED FROM SOLAREEDGE INVERTER OR SOLAREEDGE 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									
Material	UL94 V-0, UV Resistant									
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 153 x 29.5 / 5.1 x 6 x 1.16	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	655 / 1.5	845 / 1.9		1064 / 2.3	gr / lb	
Input Connector	MC4 ⁽³⁾						Single or dual MC4 ⁽³⁾⁽⁴⁾	MC4 ⁽³⁾		
Input Wire Length	0.16 / 0.52								m / ft	
Output Wire Type / Connector	Double Insulated / MC4									
Output Wire Length	0.9 / 2.95			1.2 / 3.9						m / ft
Operating Temperature Range ⁽⁵⁾	-40 - +85 / -40 - +185								°C / °F	
Protection Rating	IP68 / NEMA6P									
Relative Humidity	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) NEC 2017 requires max input voltage be not more than 80V

(3) For other connector types please contact SolarEdge

(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 / +185°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	Single phase	Three Phase for 208V grid	Three Phase for 277/480V grid	
Minimum String Length (Power Optimizers)	P320, P340, P370, P400, P401	8	10	18	
	P405, P485, P505	6	8	14	
Maximum String Length (Power Optimizers)		25	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/default/files/string_sizing_na.pdf

(7) It is not allowed to mix P405/P485/P505 with P320/P340/P370/P400/P401 in one string

(8) A string with more than 30 optimizers does not meet NEC rapid shutdown requirements; safety voltage will be above the 30V requirement

(9) For 208V grid: it is allowed to install up to 6,500W per string when the maximum power difference between each string is 1,000W

(10) For 277/480V grid: it is allowed to install up to 15,000W per string when the maximum power difference between each string is 2,000W

Subject: ETL Evaluation of SolarEdge Products to NEC 2017 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 860.

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.

(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

SE9KUS / SE10KUS / SE14.4KUS / SE20KUS / SE30KUS / SE33.3KUS / SE43.2KUS / SE66.6KUS / SE100KUS; 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, 2017, 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."

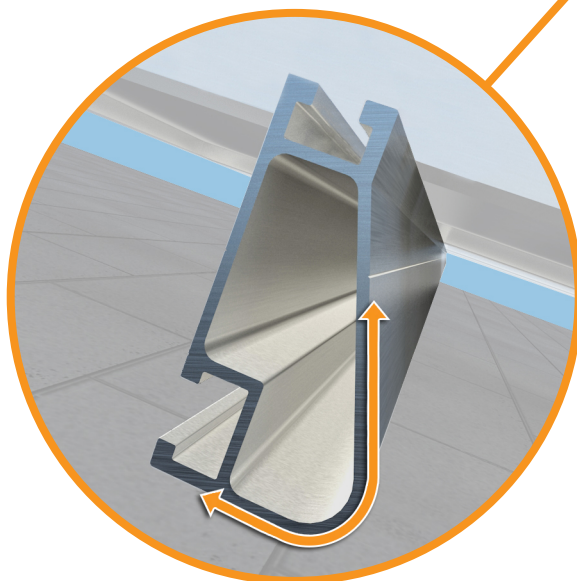
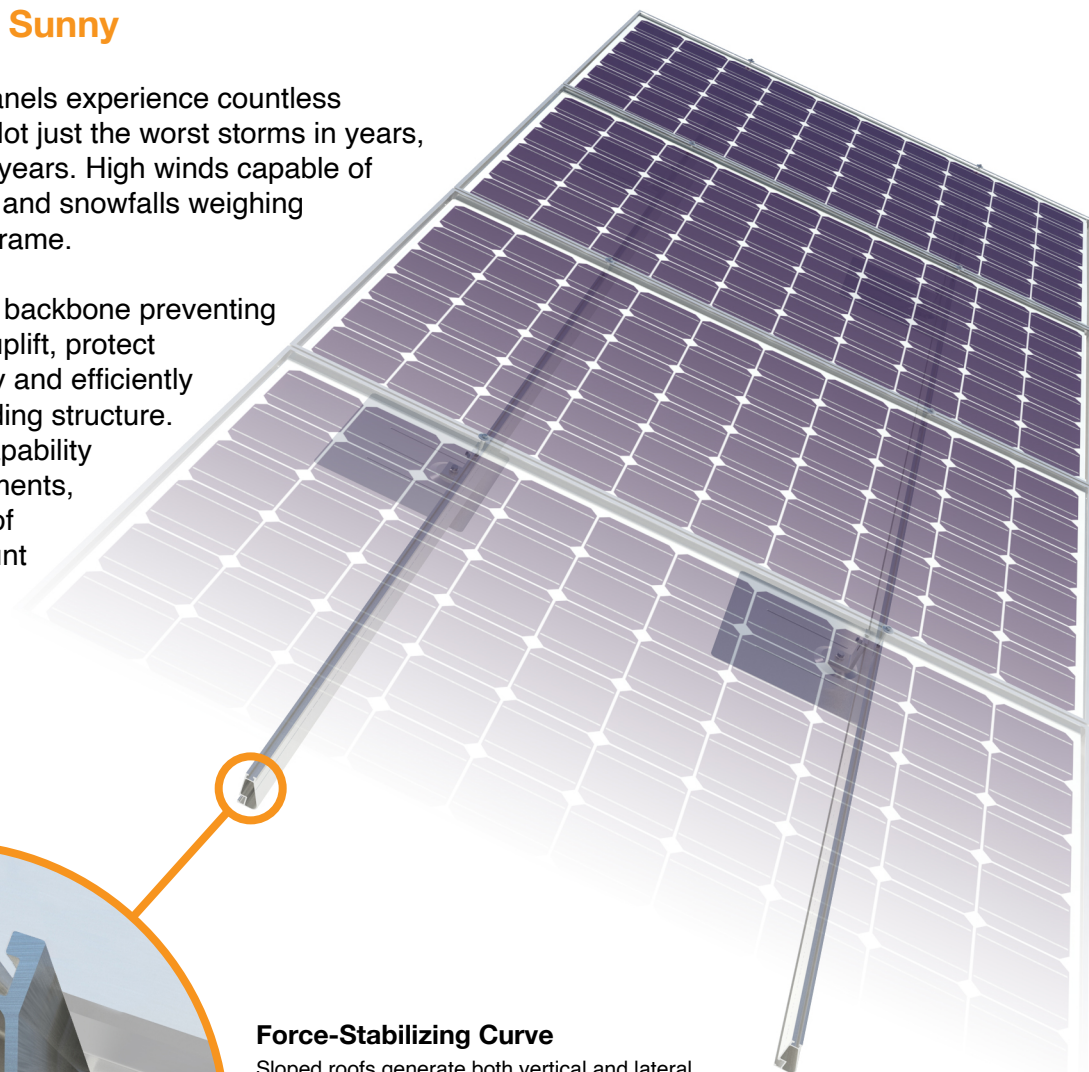
Signature: 

Name: Mukund Rana
Position: Engineering Team Leader
Date: 2/11/2020

Solar Is Not Always Sunny

Over their lifetime, solar panels experience countless extreme weather events. Not just the worst storms in years, but the worst storms in 40 years. High winds capable of ripping panels from a roof, and snowfalls weighing enough to buckle a panel frame.

XR Rails are the structural backbone preventing these results. They resist uplift, protect against buckling and safely and efficiently transfer loads into the building structure. Their superior spanning capability requires fewer roof attachments, reducing the number of roof penetrations and the amount of installation time.



Force-Stabilizing Curve

Sloped roofs generate both vertical and lateral forces on mounting rails which can cause them to bend and twist. The curved shape of XR Rails is specially designed to increase strength in both directions while resisting the twisting. This unique feature ensures greater security during extreme weather and a longer system lifetime.

Compatible with Flat & Pitched Roofs



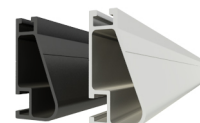
XR Rails are compatible with FlashFoot and other pitched roof attachments.



IronRidge offers a range of tilt leg options for flat roof mounting applications.

Corrosion-Resistant Materials

All XR Rails are made of 6000-series aluminum alloy, then protected with an anodized finish. Anodizing prevents surface and structural corrosion, while also providing a more attractive appearance.



XR Rail Family

The XR Rail Family offers the strength of a curved rail in three targeted sizes. Each size supports specific design loads, while minimizing material costs. Depending on your location, there is an XR Rail to match.



XR10

XR10 is a sleek, low-profile mounting rail, designed for regions with light or no snow. It achieves spans up to 6 feet, while remaining light and economical.

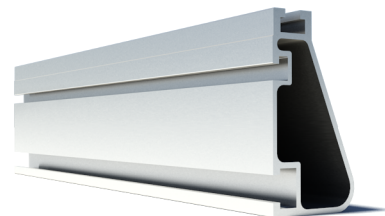
- 6' spanning capability
- Moderate load capability
- Clear & black anodized finish
- Internal splices available



XR100

XR100 is the ultimate residential mounting rail. It supports a range of wind and snow conditions, while also maximizing spans up to 10 feet.

- 10' spanning capability
- Heavy load capability
- Clear & black anodized finish
- Internal splices available



XR1000

XR1000 is a heavyweight among solar mounting rails. It's built to handle extreme climates and spans up to 12 feet for commercial applications.

- 12' spanning capability
- Extreme load capability
- Clear anodized finish
- Internal splices available

Rail Selection

The table below was prepared in compliance with applicable engineering codes and standards.* Values are based on the following criteria: ASCE 7-16, Gable Roof Flush Mount, Roof Zones 1 & 2e, Exposure B, Roof Slope of 8 to 20 degrees and Mean Building Height of 30 ft. Visit IronRidge.com for detailed certification letters.

Load		Rail Span					
Snow (PSF)	Wind (MPH)	4'	5' 4"	6'	8'	10'	12'
None	90						
	120						
	140	XR10		XR100		XR1000	
	160						
20	90						
	120						
	140						
	160						
30	90						
	160						
40	90						
	160						
80	160						
120	160						

*Table is meant to be a simplified span chart for conveying general rail capabilities. Use approved certification letters for actual design guidance.

The Strongest Attachment in Solar

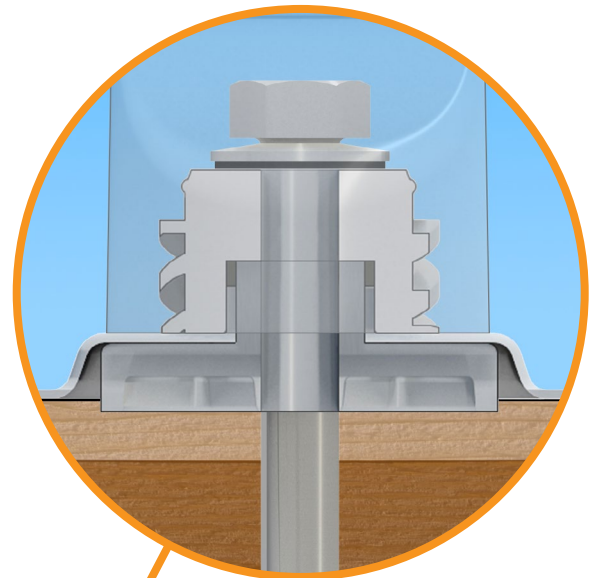
IronRidge FlashFoot2 raises the bar in solar roof protection. The unique water seal design is both elevated and encapsulated, delivering redundant layers of protection against water intrusion. In addition, the twist-on Cap perfectly aligns the rail attachment with the lag bolt to maximize mechanical strength.

Twist-On Cap

FlashFoot2's unique Cap design encapsulates the lag bolt and locks into place with a simple twist. The Cap helps FlashFoot2 deliver superior structural strength, by aligning the rail and lag bolt in a concentric load path.

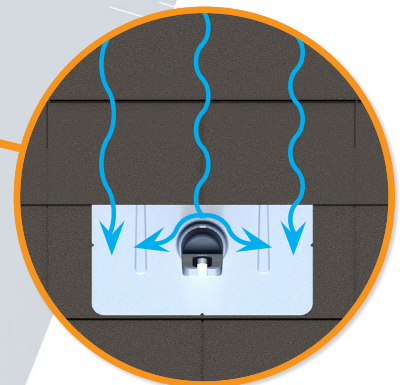
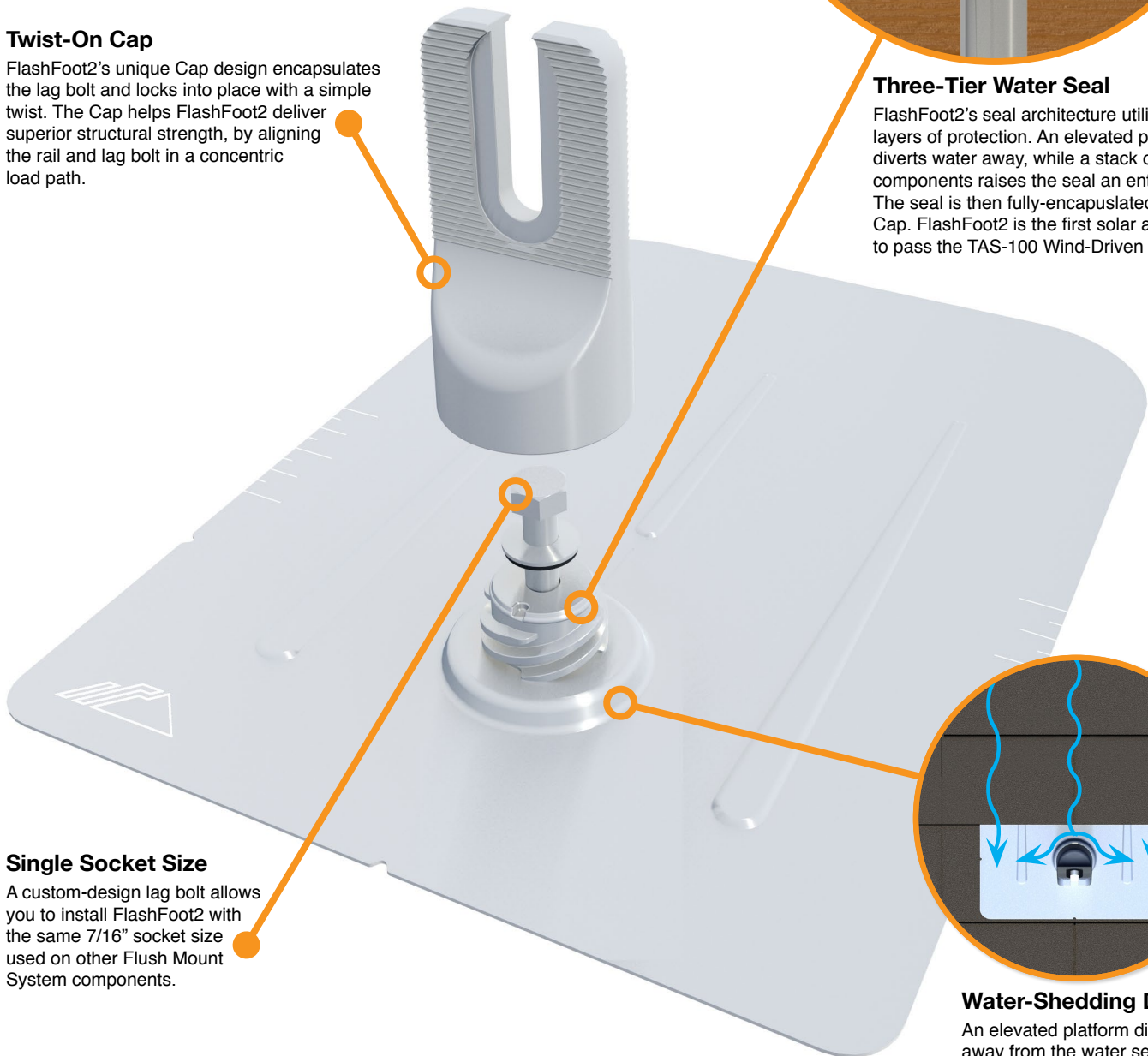
Single Socket Size

A custom-design lag bolt allows you to install FlashFoot2 with the same 7/16" socket size used on other Flush Mount System components.



Three-Tier Water Seal

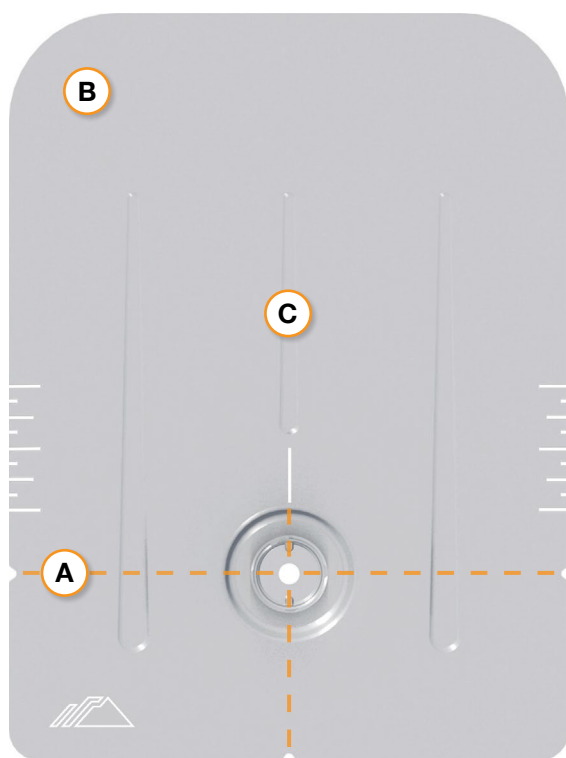
FlashFoot2's seal architecture utilizes three layers of protection. An elevated platform diverts water away, while a stack of rugged components raises the seal an entire inch. The seal is then fully-encapsulated by the Cap. FlashFoot2 is the first solar attachment to pass the TAS-100 Wind-Driven Rain Test.



Water-Shedding Design

An elevated platform diverts water away from the water seal.

Installation Features



A Alignment Markers

Quickly align the flashing with chalk lines to find pilot holes.

B Rounded Corners

Makes it easier to handle and insert under the roof shingles.

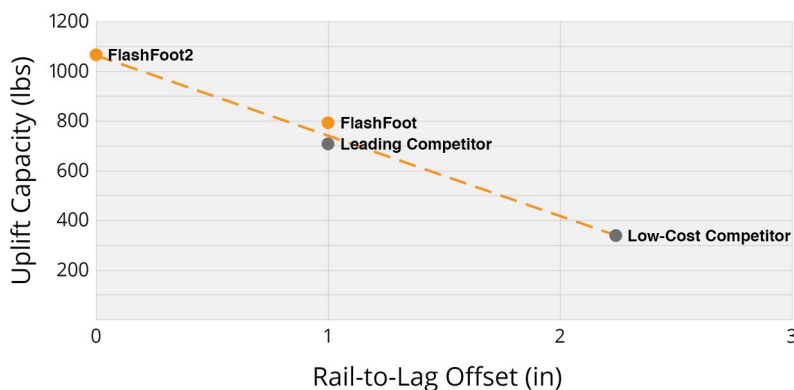
C Reinforcement Ribs

Help to stiffen the flashing and prevent any bending or crinkling during installation.

Benefits of Concentric Loading

Traditional solar attachments have a horizontal offset between the rail and lag bolt, which introduces leverage on the lag bolt and decreases uplift capacity.

FlashFoot2 is the only product to align the rail and lag bolt. This concentric loading design results in a stronger attachment for the system.



Testing & Certification

Structural Certification

Designed and Certified for Compliance with the International Building Code & ASCE/SEI-7.

Water Seal Ratings

Water Sealing Tested to UL 441 Section 27 "Rain Test" and TAS 100-95 "Wind Driven Rain Test" by Intertek. Ratings applicable for composition shingle roofs having slopes between 2:12 and 12:12.

UL 2703

Conforms to UL 2703 Mechanical and Bonding Requirements. See Flush Mount Install Manual for full ratings.

CHECKLIST

PRE-INSTALLATION

- Verify module compatibility. See [Page 13](#) for info.

TOOLS REQUIRED

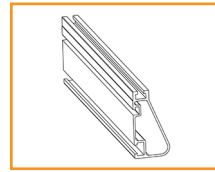
- Cordless Drill (non-impact)
- Impact Driver (for lag bolts)
- Torque Wrench (0-250 in-lbs)
- 5/16" Socket
- 7/16" Socket
- 1/2" Socket
- String Line

TORQUE VALUES

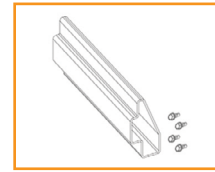
- FlashFoot2 Lag Bolts (7/16" Socket): Fully Seat
- Bonded Splice Screws (5/16" Socket): 20 in-lbs
- Grounding Lug Nuts (7/16" Socket): 80 in-lbs
- Grounding Lug Terminal Screws (7/16" Socket): 20 in-lbs
- Universal Fastening Object (7/16" Socket): 80 in-lbs
- Expansion Joint Nuts (7/16" Socket): 80 in-lbs
- Flush Standoffs (1/2" Socket): 132 in-lbs
- Microinverter Kit Nuts (7/16" Socket): 80 in-lbs
- Frameless Module Kit Nuts (7/16" Socket): 80 in-lbs
- 3/8" Bonding Hardware Nuts (7/16" Socket): 250 in-lbs
- All Tile Hook Lags (7/16" Socket): Fully Seat
- All Tile Hook Carriage Bolts (7/16" Socket): 132 in-lbs
- Knockout Tile Lags (1/2" Socket): Fully Seat
- Knockout Tile Nuts (1/2" Socket): 132 in-lbs
- Flat Roof Attachment Nuts (9/16" Socket): 250 in-lbs

💡 If using FlashVue or previous version of: FlashFoot, Integrated Grounding Mid Clamps, Grounding Lug, End Clamps, and Expansion Joints please refer to Alternate Components Addendum (Version 1.3).

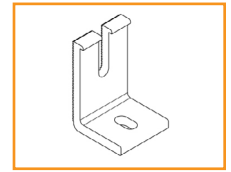
IRONRIDGE COMPONENTS



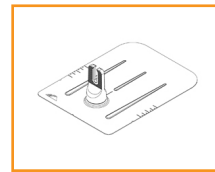
XR Rail



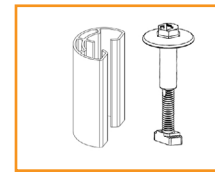
Bonded Splice



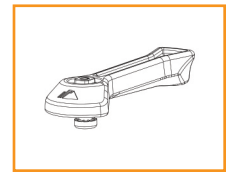
L-Foot



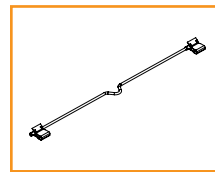
FlashFoot2



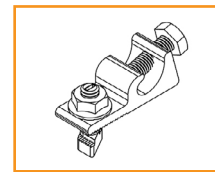
UFO and Stopper Sleeve



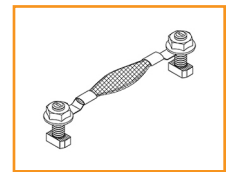
CAMO



8" Bonding Jumper



Grounding Lug



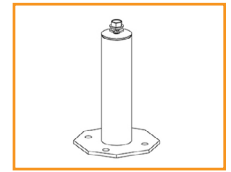
Expansion Joint



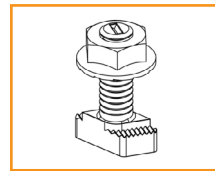
End Cap



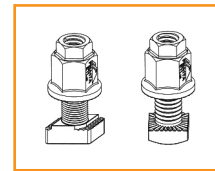
Wire Clip



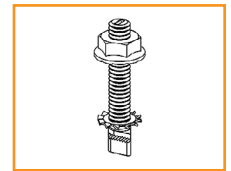
Flush Standoff



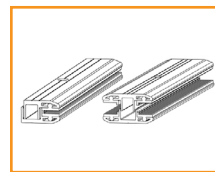
Microinverter Kit



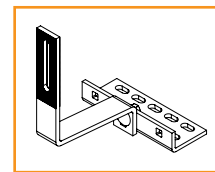
3/8" Bonding Hardware



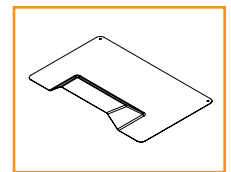
Frameless Module Kit



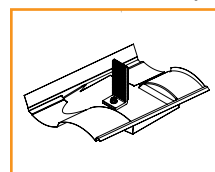
Frameless End/Mid Clamp



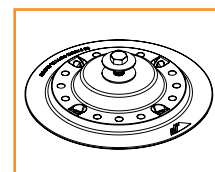
All Tile Hook



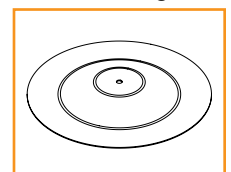
All Tile Hook Flashing



Knockout Tile



Flat Roof Attachment



Membrane Flashing



by Schneider Electric

List Price \$353.00 USD

Availability **Stock Item: This item is normally stocked in our distribution facility.**

Technical Characteristics

Number of Poles	2-Pole
Terminal Type	Lugs
Type of Duty	General Duty
Maximum Voltage Rating	240VAC
Wire Size	#10 to #2 AWG(Al) - #14 to #2 AWG(Cu)
Action	Single Throw
Ampere Rating	60A
Approvals	UL Listed File Number E2875
Enclosure Rating	NEMA 3R
Enclosure Type	Rainproof and Sleet/Ice proof (Indoor/Outdoor)
Factory Installed Neutral	No
Disconnect Type	Non-Fusible
Mounting Type	Surface

Shipping and Ordering

Category	00106 - Safety Switch, General Duty, 30 - 200 Amp, NEMA3R
Discount Schedule	DE1A
GTIN	00785901491491
Package Quantity	1
Weight	4.7 lbs.
Availability Code	Stock Item: This item is normally stocked in our distribution facility.
Returnability	Y
Country of Origin	MX

As standards, specifications, and designs change from time to time, please ask for confirmation of the information given in this document.

Quicklag® Residential Circuit Breakers

Type BR Plug-in Molded Case Circuit Breakers

10-100 Amperes, 240/415 Volts, 40°C

(50°C Rating Available)

Built to BS3871, Part 1

Interrupting Ratings

Stand-alone Interrupting Ratings:

M3 (3,000 AIC)

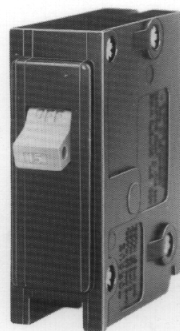
Series Interrupting Ratings:

Available in combination with larger Westinghouse molded case circuit breakers.

10 KAIC

Specifications

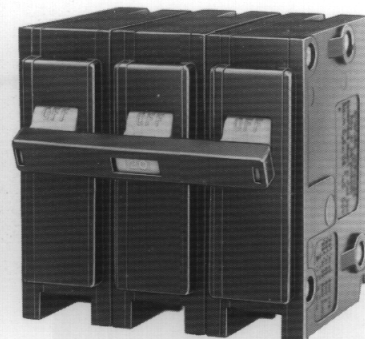
- Modular Circuit Breakers: 25 mm (1 inch) module.
- Current Ratings: 10 to 100 Amps; 1, 2, and 3 poles.
- Thermal-Magnetic design.
- Maximum operating voltages: 240/415 VAC.
- Toggle Handle indicates 'ON', 'OFF' and 'TRIPPED' positions.
- Trip free mechanism in every pole.
- All multi-pole breakers incorporate internal common trip mechanism.
- Ampere ratings clearly visible on handles.
- All ferrous metal parts plated to resist corrosion.
- No internal aluminum parts.
- AB DE-ION Arcs36Extinguishers in every pole.
- Steel frame construction used in every pole.



1 Pole
Type BR



2 Pole
Type BR



3 Pole
Type BR

Selection Data and Catalog Numbers

Cont. Amp Rating	Catalog Numbers		
	1 Pole	2 Poles	3 Poles
BS3871-Part 1 240/415 VAC	M3	M3	M3

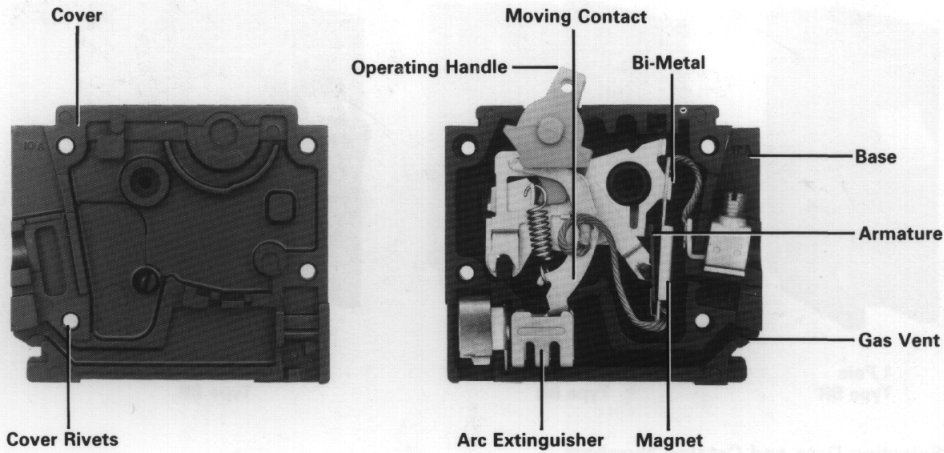
Type BR Plug-in Thermal-Magnetic Circuit Breakers

Amp Rating	1 Pole	2 Poles	3 Poles
15	BR115	BR215	BR315
20	BR120	BR220	BR320
25	BR125	BR225	BR325
30	BR130	BR230	BR330
40	BR140	BR240	BR340
50	BR150	BR250	BR350
60	BR160	BR260	BR360
70	BR170	BR270	BR370
90	BR290	BR390
100	BR2100	BR3100

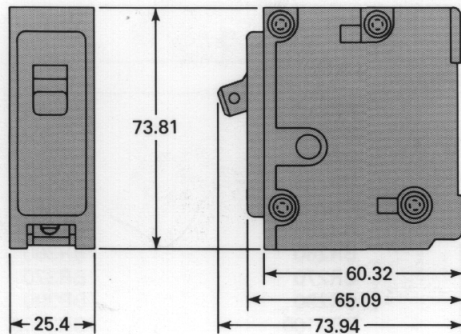
Quicklag[®] Residential Circuit Breakers

Typical Exploded View (Type P Plug-in Breaker Shown)

1 Pole



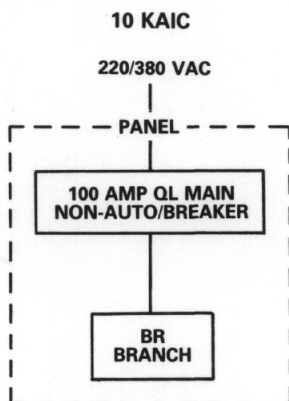
Dimensions, Millimeters^① *Not to be used for construction purposes.*



Type BR

① 2-pole breaker is 50.8 mm wide, 3-pole is 75.9 mm wide.

Series Rating Combination



Circuit Breaker Mounting

Type BR (Plug-in):

The load end of the breaker is inserted under the mounting clamp of a panelboard and the line end is merely snapped into position over the bus stab.

Circuit Breaker Removal

Before inspecting, installing or removing from a circuit, the circuit breaker should be in the "OFF" position, and if practical, the circuit should be de-energized.

Inspection and Maintenance

Good maintenance procedure calls for periodic inspection of all electrical apparatus including molded case circuit breakers. Terminal lugs must be tight to prevent overheating. Due to the inherent wiping action built into the moving contacts of all Westinghouse circuit breakers, operating the breaker several times under load will remove any high resistance film that may have formed.

Accessories and Modifications

Accessories and modifications available include: lockdog, handle locks for use with a padlock, moisture and fungus treatment, shunt trip breakers, and earth leakage breakers for special applications.

SolaDeck

PV ROOF-MOUNT ENCLOSURE

**INTRODUCED AT
*SOLAR POWER 2007***



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

Enclosure Includes:

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

PV Roof-Mount Combiner/Enclosure

Benefits

- The ability to prep the building is now possible
- Replaces several parts used today
- Provides professional looking install
- Saves time on install
- Allows for easy access
- Guaranteed seal to roof
- Low profile design

***For product information contact us at
(866) 367-7782***

www.commdeck.com



RSTC Enterprises, Inc
2219 Heimstead Road
Eau Claire, WI 54703
1 (866) 367 - 7782



SolaDeck Part # 780

Specifications:

18 Gauge Steel Base (1) and Cover (2)
Pre Punched 7 holes in base (1) for roof deck
Pre Punched 4 holes in base (1) and cover (2) for match
Draw Process both parts
Powder Coated to withstand 1000 hours Salt Spray (Primer Gray)
High UV resistance
15" x 15" flashing dimension
Cavity dimension 8"W x 9" L x 2.5"D
Approx. 162 Cubic inch equipment cavity
Norloked steel base plate (3) to drawn base (2)
Three knockout locations .5", .75" and 1"
3" DIN rail installed
Grounding Lug- Installed (In Equipment Cavity)
Wire Strain Relief Clip –Installed (In Equipment Cavity)
Hardware pack withstands 500 hours Salt Spray
7 - 2" Trusshead Screws
4 - .5" 8-32 thread cutting screws
4 - #10 Bonded Seal washers
1 – Foam closed Cell Seal
ETL Listed UL50 Type 3R

Total Weight 6.9 pounds each

Packaging:

Individually bagged and boxed
Box dimension 15.5"w x 16" L x 3" D
White Carton labeled with Cut out template
Print One Color - Black

Master Cartons of 6 Units each
Master Carton dimension 18.75"x16"x16.375"
Master Carton Weight – 42 pounds
18 Master Cartons per skid Approx 800 pounds with skid