

SYSTEM RATING

ROOF-1 3.600 kW DC STC
 ROOF-2 2.400 kW DC STC

TOTAL: 6.000 kW DC STC

EQUIPMENT SUMMARY

15 REC SOLAR REC400AA 400-W MODULES
 1 SOLAREEDGE SE7600H-US INVERTER
 15 SOLAREEDGE S440 OPTIMIZERS

IronRidge Racking Components

Part	Quantity
14' Rails	12
17' Rails	-
End Caps	16
Splices	4
UFO Clamps	44
Stopper Sleeves	16
Flash Loc Attachments	36
Ground Lug Kit	4
30" Fixed Tilt Leg Kits	-
20" Fixed Tilt Leg Kits	-



April 4, 2023



DESIGN & DRAFTING BY:
 DANA HAJEDEMOS



REVISIONS		
DESCRIPTION	DATE	REV
ORIGINAL	10/7/2022	A



PROJECT NAME

BAHR, PAOLO
 1820 NORTH TEJON STREET
 COLORADO SPRINGS, CO, 80907

SHEET NAME

COVER

SHEET SIZE

11" x 17"

SHEET NUMBER

PV-1

SHEET INDEX

PV-1 COVER
 PV-2 SITE PLAN
 PV-2.1 EQUIPMENT LAYOUT
 S-1 STRUCTURAL SHEET
 PV-3 MOUNTING DETAIL
 PV-3.1 MOUNTING DETAIL
 PV-3.2 MOUNTING DETAIL
 PV-4 SPEC SHEETS
 PV-5 SPEC SHEETS
 PV-6 SPEC SHEETS
 PV-7 PV METER SPEC SHEET
 E-1 ELECTRICAL DIAGRAM
 E-2 SIGNAGE

GOVERNING CODES

2020 NATIONAL ELECTRICAL CODE
 UNDERWRITERS LABORATORIES (UL) STANDARDS
 UL 1703 FOR MODULES, UL 1741 FOR INVERTERS
 2015 IRC

AERIAL VIEW

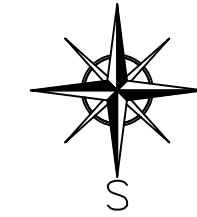
SITE PLAN

- (15) REC SOLAR REC400AA 400-W MODULES TOTAL, 6.000 kW DC STC
- (1) SOLAREEDGE SE7600H-US INVERTER, TOTAL 7.600 kW AC
- (15) SOLAREEDGE S440 OPTIMIZERS

SINGLE STORY ACCESS

FLUSH MOUNTED ROOF ARRAYS: COMP SHINGLE ROOFING
 ROOF/ARRAY #1 - 23°Pitch, 90°Azimuth - (9) MODULES
 ROOF/ARRAY #2 - 23°Pitch, 270°Azimuth - (6) MODULES

DRAWING SCALE: 3/32"=1'-0"



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DANA HAJEDEMOS



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PROJECT NAME

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 1820 NORTH TEJON STREET
 COLORADO SPRINGS, CO, 80907

SHEET NAME

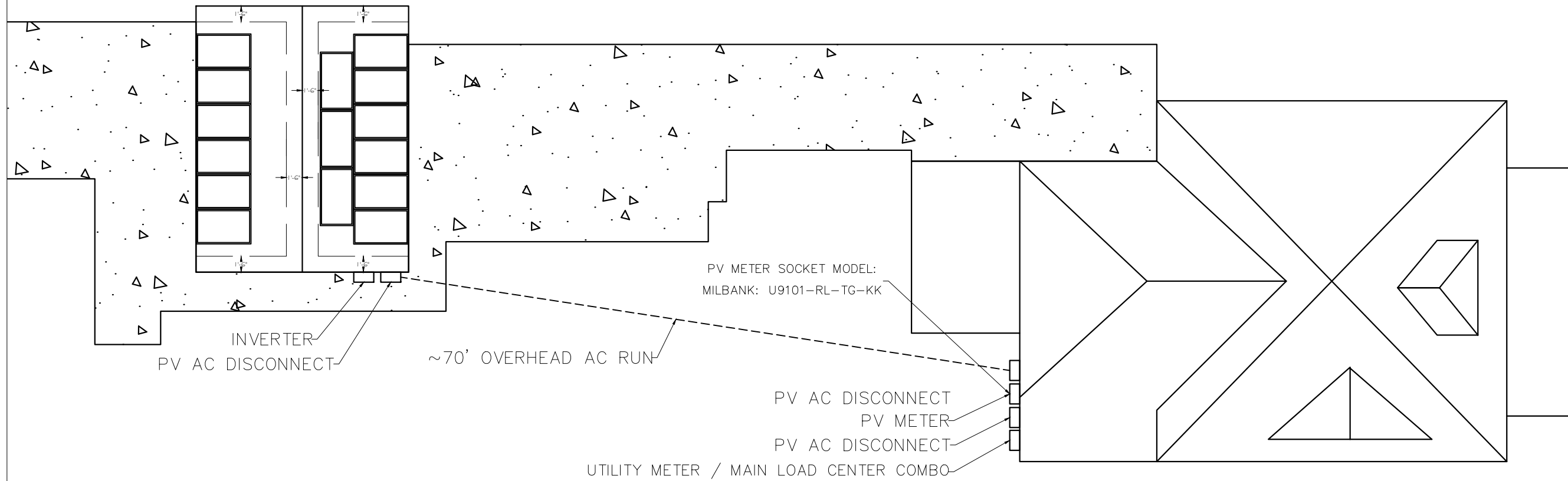
SITE MAP

SHEET SIZE

11" x 17"

SHEET NUMBER

PV-2



CONSTRUCTION SUMMARY

ROOF/ARRAY 1 & 2 – 23° PITCH, 270°, 90° AZIMUTH

UNKNOWN SYP 2x6 RAFTERS @ 24" O.C. SPACING SUPPORTING
COMP SHINGLE ROOFING

BUILDING IMPORTANCE CATEGORY II
WIND EXPOSURE CATEGORY C

ASCE 7-10 DESIGN WINDSPEED: 130 MPH, 3 SECOND GUST
SNOW LOAD 30 PSF

BUILDING RIDGE ELEVATION: 15'

FLASHFOOT2 ATTACHMENT POINTS

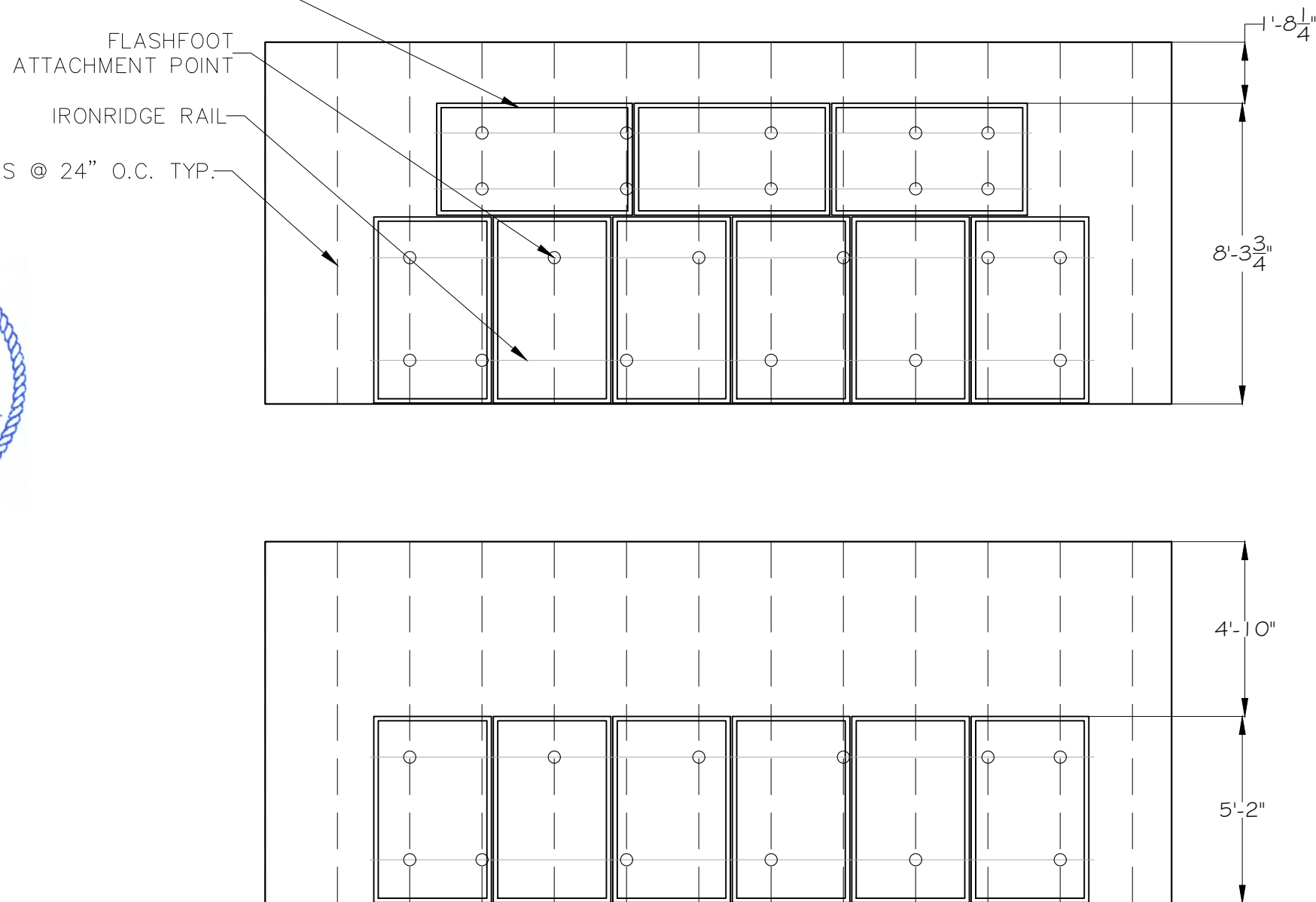
IRONRIDGE RAIL
☐XR10 ☑XR100 ☐XR1000

DRAWING SCALE
1/4" = 1'-0"

SOLAR MODULE
FLASHFOOT
ATTACHMENT POINT
IRONRIDGE RAIL
RAFTERS @ 24" O.C. TYP.



April 4, 2023



LOAD CALCULATIONS (ROOF - 1)	
TOTAL # OF MODULES	9
TOTAL # OF STANDOFFS	22
LINEAR FT OF RAIL	76 FT
MODULE WEIGHT	45 LBS
STANDOFF WEIGHT	2.0 LBS
RAIL WEIGHT LBS/FT	0.9 LBS
TOTAL MODULE WEIGHT	405 LBS
TOTAL STANDOFF WEIGHT	44.0000 LBS
TOTAL RAIL WEIGHT	68.4000 LBS
TOTAL ARRAY WEIGHT	517.4000 LBS
TOTAL ARRAY AREA	157.5000 FT ²
POINT LOAD	23.5 LBS
DEAD LOAD	3.29 LBS/FT ²

LOAD CALCULATIONS (ROOF - 2)	
TOTAL # OF MODULES	6
TOTAL # OF STANDOFFS	12
LINEAR FT OF RAIL	42 FT
MODULE WEIGHT	45 LBS
STANDOFF WEIGHT	2.0 LBS
RAIL WEIGHT LBS/FT	0.9 LBS
TOTAL MODULE WEIGHT	270 LBS
TOTAL STANDOFF WEIGHT	24.0000 LBS
TOTAL RAIL WEIGHT	37.8000 LBS
TOTAL ARRAY WEIGHT	331.8000 LBS
TOTAL ARRAY AREA	105.0000 FT ²
POINT LOAD	27.7 LBS
DEAD LOAD	3.16 LBS/FT ²

DESIGN & DRAFTING BY:
DANA HAJEDEMOS



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PROJECT NAME

BAHR, PAOLO
1820 NORTH TEJON STREET
COLORADO SPRINGS, CO, 80907

SHEET NAME

ROOF 1

SHEET SIZE

11" x 17"

SHEET NUMBER

S-1



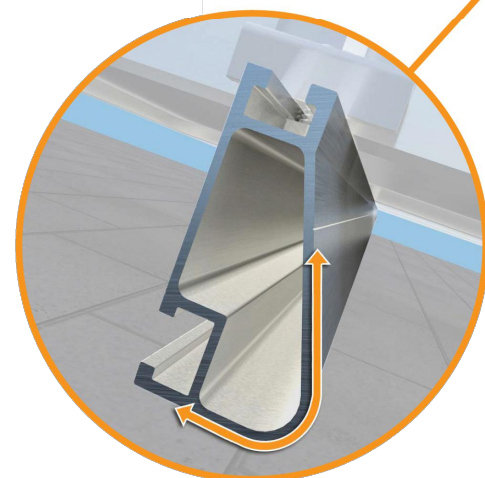
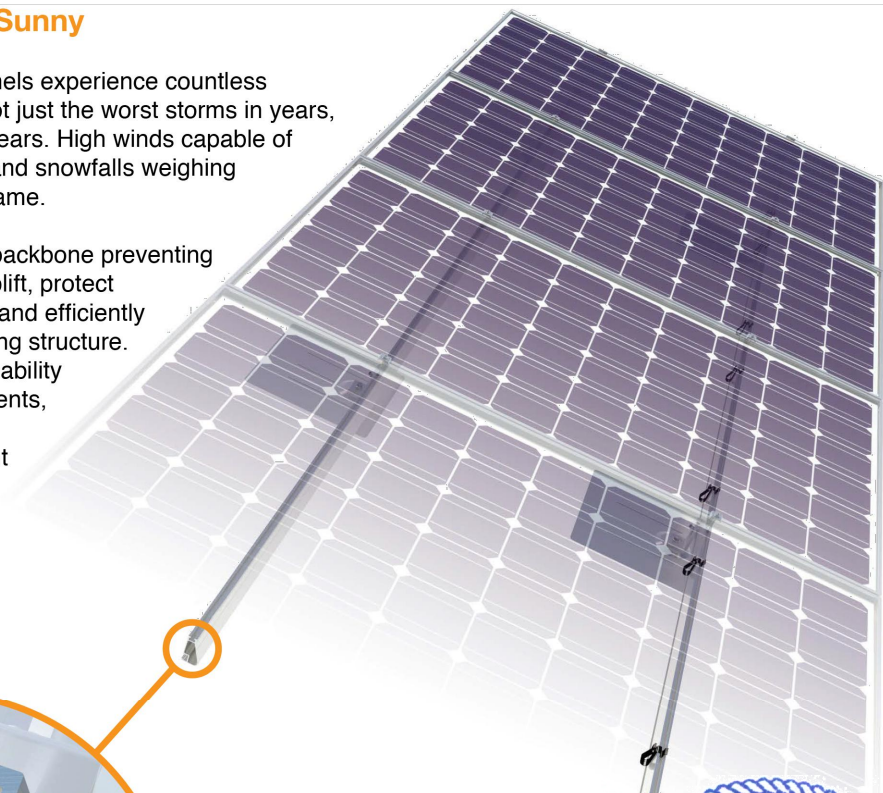
XR Rail Family

Tech Brief

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.



April 4, 2023

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

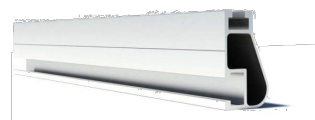
All XR Rails are made of marine-grade aluminum alloy, then protected with an anodized finish. Anodizing prevents surface and structural corrosion, while also providing a more attractive appearance.



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.

Tech Brief



XR10

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

- 6' spanning capability
- Moderate load capability
- Clear 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 8 feet.

- 8' 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 12 feet or more for commercial applications.

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

Rail Selection

The following table was prepared in compliance with applicable engineering codes and standards. Values are based on the following criteria: ASCE 7-10, Roof Zone 1, Exposure B, Roof Slope of 7 to 27 degrees and Mean Building Height of 30 ft. Visit IronRidge.com for detailed span tables and certifications.

Load		Rail Span					
Snow (PSF)	Wind (MPH)	4'	5' 4"	6'	8'	10'	12'
None	100	XR10		XR100		XR1000	
	120						
	140						
	160						
10-20	100						
	120						
	140						
30	100						
	160						
40	100						
	160						
50-70	160						
80-90	160						

DESIGN & DRAFTING BY:
DANA HAJEDEMOS



PV Installation
Professional
Dana Hajedemos
PV-200434-020500

REVISIONS

DESCRIPTION	DATE	REV
ORIGINAL	10/7/2022	A



PROJECT NAME

BAHR, PAOLO
1820 NORTH TEJON STREET
COLORADO SPRINGS, CO, 80907

SHEET NAME

MOUNTING
DETAIL

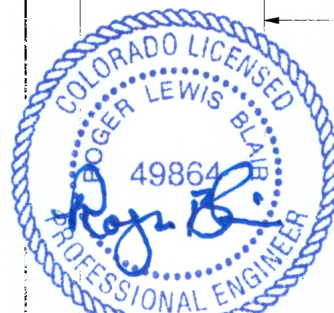
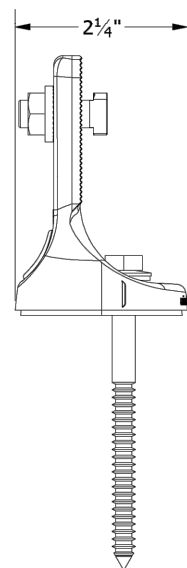
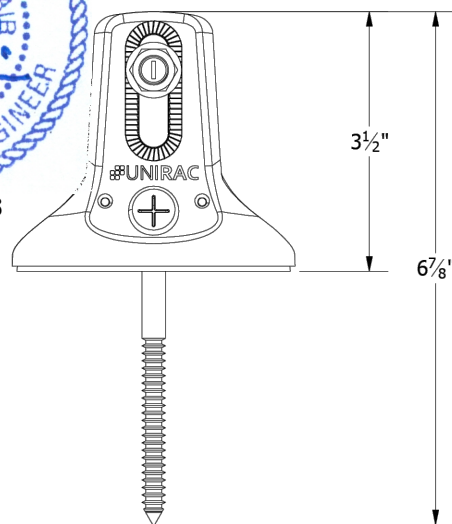
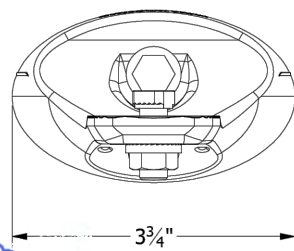
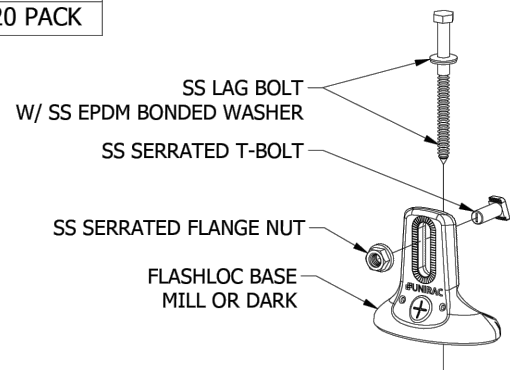
SHEET SIZE

11" x 17"

SHEET NUMBER

PV-3

PART TABLE	
P/N	DESCRIPTION
004085M	FLASHLOC COMP KIT MILL, 20 PACK
004085D	FLASHLOC COMP KIT DARK, 20 PACK



April 4, 2023

UNIRAC
 1411 BROADWAY BLVD. NE
 ALBUQUERQUE, NM 87102 USA
 PHONE: 505.242.6411
 WWW.UNIRAC.COM

PRODUCT LINE:	SOLARMOUNT
DRAWING TYPE:	PART DRAWING
DESCRIPTION:	FLASHLOC COMP KIT
REVISION DATE:	10/3/2019

DRAWING NOT TO SCALE
 ALL DIMENSIONS ARE
 NOMINAL

PRODUCT PROTECTED BY
 ONE OR MORE US PATENTS

LEGAL NOTICE

FL-A01
 SHEET

MODULE COMPATIBILITY

Panasonic (HIT)	Panasonic modules with 35 and 40 mm frames VBHNxxxYYzzA Where "YY" can be either KA, RA, SA or ZA; "zz" can be either 01, 02, 03, 04, 06, 06B, 11, 11B, 15, 15B, 16, 16B, 17, or 18; and "A" can be blank, E, G, or N
Panasonic (EverVolt)	Panasonic modules with 30 mm frames EVPVxxxA Where "A" can be blank or H, K or PK
Peimar	Peimar modules with 40 mm frames SbxxxYzz Where "b" can be G, M or P; "Y" can be M or P; and "zz" can be blank, (BF) or (FB)
Philadelphia Solar	Philadelphia modules with 35 and 40 mm frames PS-YzzAA-xxx Where "Y" can be M or P; "zz" can be 60, 72 or 144; and "AA" can be blank, (BF), (HC) or (HCBF)
Phono Solar	Phono Solar modules with 30, 35 and 40mm frames PSxxxY-ZZ/A Where "Y" can be M, M1, MH, M1H, M4, M4H, M5GF, M5GFH, M6, M6H, M8GF, M8GFH or P; "ZZ" can be 18, 20 or 24; and "A" can be F, T, TH, U, UH, UHB, VH or VHB
Prism Solar	Prism Solar modules with 35mm frames PST-xxxW-M72Y Where "Y" can be H, HB or HBI
Recom	Recom modules with 35 and 40 mm frames RCM-xxx-6yy Where "yy" can be MA, MB, ME or MF
REC Solar	REC modules with 30 and 38 mm frames RECxxxYYZZ Where "YY" can be AA, M, NP, NP2, PE, PE72, TP, TP2, TP2M, TP2SM, TP2S, TP3M or TP4; and "ZZ" can be blank, Black, BLK, BLK2, SLV, 72, or Pure
Renesola	ReneSola modules with 35 and 40 mm frames AAxxxY-ZZ Where "AA" can be SPM(SLP) or JC; "Y" can be blank, F, M or S; and "ZZ" can be blank, Ab, Ab-b, Abh, Abh-b, Abv, Abv-b, Bb, Bb-b, Bbh, Bbh-b, Bbv, Bbv-b, Db, Db-b, or 24/Bb
Renogy	Renogy Modules with 40 mm frames RNG-xxxY Where "xxx" is the module power rating; and "Y" can be D or P
Risen	Risen Modules with 30, 35 and 40 mm frames RSMyy-a-xxxZZ Where "yy" can be 60, 72, 110, 120, 132 or 144; "a" can be 6, 7 or 8; and "ZZ" can be M, P or BMDG
S-Energy	S-Energy modules with 35 and 40mm frames SABB-CCYYY-xxxZ Where "A" can be C, D, L or N; "BB" can be blank, 20, 25, 40 or 45; "CC" can be blank, 60 or 72; "YYY" can be blank, BDE, MAE, MAI, MBE, MBI, MCE or MCI; and "Z" can be V, M-10, P-10 or P-15
SEG Solar	SEG Solar with 30, 35 and 40 mm frames SEG-aYY-xxxZZ Where "a" can be blank, 6 or B; "YY" can be blank, MA, MB, PA, or PB; and "ZZ" can be blank, BB, BG, BW, HV, WB, WW, BMB, BMA-HV, BMA-BG, BMA-TB, BMB-TB, BMB-HV, BMD-HV, BMB-BG
Seraphim USA	Seraphim modules with 30, 35 and 40 mm frames SRP-xxx-YYY-ZZ Where "xxx" is the module power rating; and "YYY" can be BMA, BMD, 6MA, 6MB, 6PA, 6PB, 6QA-XX-XX, and 6QB-XX-XX; ZZ is blank, BB, BG or HV
Sharp	Sharp modules with 35 and 40 mm frames NUYYxxx Where "YY" can be SA or SC

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FLASH MOUNT INSTALLATION MANUAL - 25

DESIGN & DRAFTING BY:
 DANA HAJEDEMOS



REVISIONS		
DESCRIPTION	DATE	REV
ORIGINAL	10/7/2022	A



PROJECT NAME

BAHR, PAOLO
 1820 NORTH TEJON STREET
 COLORADO SPRINGS, CO, 80907

SHEET NAME
 MOUNTING
 DETAIL

SHEET SIZE

11" x 17"

SHEET NUMBER

PV-3.1

SOLAR'S MOST TRUSTED 

inter solar award
 2022 FINALIST



COMPACT PANEL SIZE

REC ALPHA[®] PURE SERIES

PRODUCT SPECIFICATIONS

410 Wp

19.3 ^W/_{FT²}

22.2% EFFICIENCY



ELIGIBLE




LEAD-FREE
ROHS COMPLIANT

EXPERIENCE



PERFORMANCE

REC ALPHA PURE SERIES



SOLAR'S MOST TRUSTED

PRODUCT SPECIFICATIONS

GENERAL DATA

Cell type: 132 half-cut REC heterojunction bifacial cells with lead-free, gapless technology, 6 strings of 22 cells in series

Glass: 0.13 in (3.2 mm) solar glass with anti-reflective surface treatment in accordance with EN 12150

Backsheet: Highly resistant polymer (black)

Frame: Anodized aluminum (black)

Junction box: 3-part, 3 bypass diodes, lead-free IP68 rated, in accordance with IEC 62790

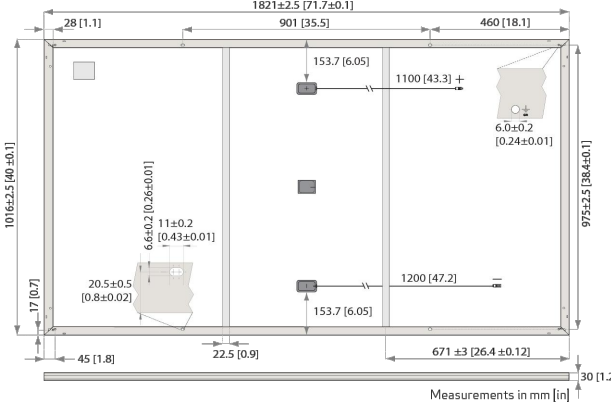
Connectors: Stäubli MC4 PV-KBT4/KST4 (4 mm²) in accordance with IEC 62852, IP68 only when connected

Cable: 12 AWG (4 mm²) PV wire, 43+47 in (1.1+1.2 m) in accordance with EN 50618

Dimensions: 71.7 x 40 x 1.2 in (19.91 ft³) / 1821 x 1016 x 30 mm (1.85 m³)

Weight: 45 lbs (20.5 kg)

Origin: Made in Singapore



Measurements in mm [in]

ELECTRICAL DATA Product Code: RECxxxAA Pure

	380	385	390	395	400	405	410
Power Output - P _{MAX} (Wp)	380	385	390	395	400	405	410
Watt Class Sorting - (W)	0/+5	0/+5	0/+5	0/+5	0/+5	0/+5	0/+5
Nominal Power Voltage - V _{MPP} (V)	40.9	41.2	41.5	41.8	42.1	42.4	42.7
Nominal Power Current - I _{MPP} (A)	9.30	9.35	9.40	9.45	9.51	9.56	9.61
Open Circuit Voltage - V _{OC} (V)	48.4	48.5	48.6	48.7	48.8	48.9	49.0
Short Circuit Current - I _{SC} (A)	10.17	10.18	10.22	10.25	10.28	10.30	10.35
Power Density (W/ft ²)	19.1	19.3	19.6	19.8	20.1	20.3	20.6
Panel Efficiency (%)	20.5	20.8	21.1	21.4	21.6	21.9	22.2

STC

	290	293	297	301	305	309	312
Power Output - P _{MAX} (Wp)	290	293	297	301	305	309	312
Nominal Power Voltage - V _{MPP} (V)	38.5	38.8	39.1	39.4	39.7	40.0	40.2
Nominal Power Current - I _{MPP} (A)	7.51	7.55	7.59	7.63	7.68	7.72	7.76
Open Circuit Voltage - V _{OC} (V)	45.6	45.7	45.8	45.9	46.0	46.1	46.2
Short Circuit Current - I _{SC} (A)	8.12	8.16	8.20	8.24	8.28	8.32	8.36






NMOT

	8.12	8.16	8.20	8.24	8.28	8.32	8.36
Short Circuit Current - I _{SC} (A)	8.12	8.16	8.20	8.24	8.28	8.32	8.36

Values at standard test conditions (STC: air mass AM1.5, irradiance 1075 W/sq ft (1000 W/m²), temperature 77°F (25°C), based on a production spread with a tolerance of P_{MAX}, V_{OC} & I_{SC} ±3% within one watt class. Nominal module operating temperature (NMOT: air mass AM1.5, irradiance 800 W/m², temperature 68°F (20°C), windspeed 3.3 ft/s (1 m/s). * Where xxx indicates the nominal power class (P_{MAX}) at STC above.

CERTIFICATIONS

IEC 61215:2016, IEC 61730:2016, UL 61730
 IEC 62804 PID
 IEC 61701 Salt Mist
 IEC 62716 Ammonia Resistance
 UL 61730 Fire Type Class 2
 IEC 62782 Dynamic Mechanical Load
 IEC 61215-2:2016 Hailstone (35mm)
 IEC 62321 Lead-free acc. to RoHS EU 863/2015
 ISO 14001, ISO 9001, IEC 45001, IEC 62941

TEMPERATURE RATINGS*

Nominal Module Operating Temperature: 44°C (±2°C)
 Temperature coefficient of P_{MAX}: -0.26 %/°C
 Temperature coefficient of V_{OC}: -0.24 %/°C
 Temperature coefficient of I_{SC}: 0.04 %/°C

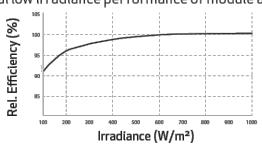
*The temperature coefficients stated are linear values

DELIVERY INFORMATION

Panels per pallet: 33
 Panels per 40 ft GP/high cube container: 792 (24 pallets)
 Panels per 53 ft truck: 891 (27 pallets)

LOW LIGHT BEHAVIOUR

Typical low irradiance performance of module at STC:



Rel. Efficiency (%) vs Irradiance (W/m²)

MAXIMUM RATINGS

Operational temperature: -40 ... +85°C
 Maximum system voltage: 1000 V
 Maximum test load (front): +7000 Pa (146 lbs/ft²)
 Maximum test load (rear): -4000 Pa (83.5 lbs/ft²)
 Max series fuse rating: 25 A
 Max reverse current: 25 A


*See installation manual for mounting instructions. Design load = Test load / 1.5 (safety factor)

WARRANTY

	Standard			REC ProTrust		
	No	Yes	Yes	No	Yes	Yes
Installed by an REC Certified Solar Professional						
System Size	All	≤25 kW	25-500 kW			
Product Warranty (yrs)	20	25	25			
Power Warranty (yrs)	25	25	25			
Labor Warranty (yrs)	0	25	10			
Power in Year 1	98%	98%	98%			
Annual Degradation	0.25%	0.25%	0.25%			
Power in Year 25	92%	92%	92%			

See warranty documents for details. Conditions apply

Founded in 1996, REC Group is an international pioneering solar energy company dedicated to empowering consumers with clean, affordable solar power. As Solar's Most Trusted, REC is committed to high quality, innovation, and a low carbon footprint in the solar materials and solar panels it manufactures. Headquartered in Norway with operational headquarters in Singapore, REC also has regional hubs in North America, Europe, and Asia-Pacific.



www.recgroup.com

DESIGN & DRAFTING BY:
DANA HAJEDEMOS



NABCEP
CERTIFIED

PV Installation Professional
Dana Hajedemos
PV-200414-020500

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DESCRIPTION	DATE	REV
ORIGINAL	10/7/2022	A



GREENSTAR
POWER

PROJECT NAME

BAHR, PAOLO
1820 NORTH TEJON STREET
COLORADO SPRINGS, CO, 80907

SHEET NAME

EQUIPMENT
SPECIFICATION
SHEETS

SHEET SIZE

11" x 17"

SHEET NUMBER

PV-4

Ref: PM-DS-12-06-Rev-G 04-22 Specifications subject to change without notice.

Single Phase Inverter with HD-Wave Technology

for North America

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



INVERTERS

Optimized installation with HD-Wave technology

- Specifically designed to work with power optimizers
- Record-breaking 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
- Extremely small
- Built-in module-level monitoring
- Outdoor and indoor installation
- Optional: Revenue grade data, ANSI C12.20 Class 0.5 (0.5% accuracy)

solaredge.com



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-XXXXBXX4								
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	600ka 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

DESIGN & DRAFTING BY:
DANA HAJEDEMOS



REVISIONS		
DESCRIPTION	DATE	REV
ORIGINAL	10/7/2022	A



PROJECT NAME

BAHR, PAOLO
1820 NORTH TEJON STREET
COLORADO SPRINGS, CO, 80907

SHEET NAME
EQUIPMENT SPECIFICATION SHEETS

SHEET SIZE
11" x 17"

SHEET NUMBER
PV-5

Power Optimizer For North America

S440, S500



POWER OPTIMIZER

PV power optimization at the module level

- Specifically designed to work with SolarEdge residential inverters
- Detected abnormal PV connector behavior, preventing potential safety issues*
- Module-level voltage shutdown for installer and firefighter safety
- Superior efficiency (99.5%)
- Mitigates all types of module mismatch loss, from manufacturing tolerance to partial shading
- Faster installations with simplified cable management and easy assembly using a single bolt
- Flexible system design for maximum space utilization
- Compatible with bifacial PV modules
- Meets NEC requirements for arc fault protection (AFCI) and Photovoltaic Rapid Shutdown System (PVRSS)

* Expected availability in 2022

solaredge.com

solaredge

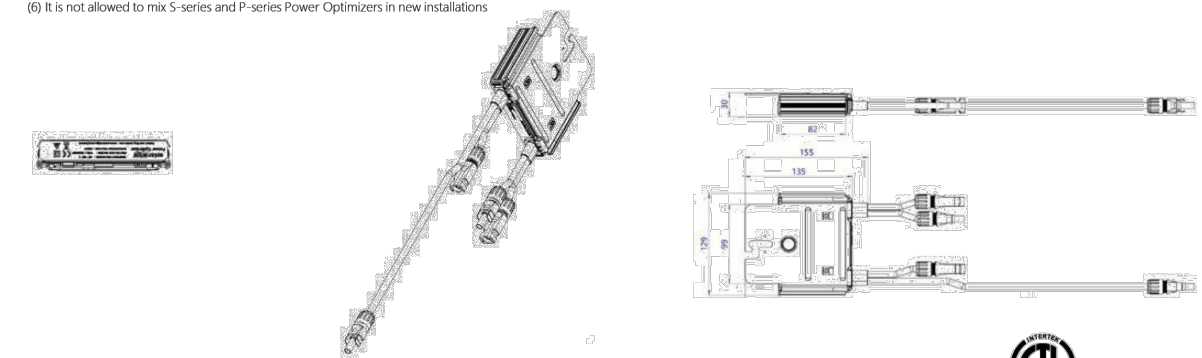
Power Optimizer For North America S440, S500

	S440	S500	Unit
INPUT			
Rated Input DC Power ⁽¹⁾	440	500	W
Absolute Maximum Input Voltage (Voc)	60		Vdc
MPPT Operating Range	8 - 60		Vdc
Maximum Short Circuit Current (Isc) of Connected PV Module	14.5	15	Adc
Maximum Efficiency	99.5		%
Weighted Efficiency	98.6		%
Overvoltage Category	II		
OUTPUT DURING OPERATION			
Maximum Output Current	15		Adc
Maximum Output Voltage	60		Vdc
OUTPUT DURING STANDBY (POWER OPTIMIZER DISCONNECTED FROM INVERTER OR INVERTER OFF)			
Safety Output Voltage per Power Optimizer	1+/-0.1		Vdc
STANDARD COMPLIANCE			
Photovoltaic Rapid Shutdown System	NEC 2014, 2017 & 2020		
EMC	FCC Part 15 Class B, IEC61000-6-2, IEC61000-6-3		
Safety	IEC62109-1 (class II safety), UL1741		
Material	UL94 V-0, UV Resistant		
RoHS	Yes		
Fire Safety	VDE-AR-E 2100-712:2013-05		
INSTALLATION SPECIFICATIONS			
Maximum Allowed System Voltage	1000		Vdc
Dimensions (W x L x H)	129 x 153 x 30 / 5.07 x 6.02 x 1.18		mm / in
Weight (including cables)	655 / 1.5		gr / lb
Input Connector	MC4 ⁽²⁾		
Input Wire Length	0.1 / 0.32		m / ft
Output Connector	MC4		
Output Wire Length	(+) 2.3, (-) 0.10 / (+) 7.54, (-) 0.32		m / ft
Operating Temperature Range ⁽³⁾	-40 to +85		°C
Protection Rating	IP68 / Type6B		
Relative Humidity	0 - 100		%

(1) Rated power of the module at STC will not exceed the power optimizer Rated Input DC Power. Modules with up to +5% power tolerance are allowed
 (2) For other connector types please contact SolarEdge
 (3) For ambient temperature above +70°C / +158°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	Single Phase HD-Wave	Three Phase for 208V grid	Three Phase for 277/480V grid	
Minimum String Length (Power Optimizers)	S440, S500	8	14	18
Maximum String Length (Power Optimizers)	25			50 ⁽⁴⁾
Maximum Nominal Power per String	5700 (6000 with SE7600-US-SE1400-U)		6000	12750 W
Maximum Allowed Connected Power per String ⁽⁵⁾ (Permitted only when the difference in connected power between strings is 1,000W or less)	Refer to Footnote 5		One String 7200W Two strings or more 7800W	15,000W
Parallel Strings of Different Lengths or Orientations	Y			

(4) A string with more than 30 optimizers does not meet NEC rapid shutdown requirements; safety voltage will be above the 30V requirement
 (5) If the inverters rated AC power < maximum nominal power per string, then the maximum power per string will be able to reach up to the inverters maximum input DC power. Refer to: <https://www.solaredge.com/sites/default/files/se-power-optimizer-single-string-design-application-note.pdf>
 (6) It is not allowed to mix S-series and P-series Power Optimizers in new installations



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DESIGN & DRAFTING BY:
DANA HAJEDEMOS



REVISIONS		
DESCRIPTION	DATE	REV
ORIGINAL	10/7/2022	A



PROJECT NAME

BAHR, PAOLO
1820 NORTH TEJON STREET
COLORADO SPRINGS, CO, 80907

SHEET NAME
EQUIPMENT
SPECIFICATION
SHEETS

SHEET SIZE
11" x 17"

SHEET NUMBER
PV-6



U9101-RL-TG-KK



Catalog Number	U9101-RL-TG-KK
Marketing Product Description	5 Terminal Ringless Small Hub Open Triplex Ground Horn Bypass
UPC	784572290426
Length (IN)	4.125
Width (IN)	11
Height (IN)	14.563
Brand Name	Milbank
Type	Ringless Meter Socket
Application	Meter Socket
Standard	UL Listed;Type 3R
Voltage Rating	600 Volts Alternating Current
Amperage Rating	200 Continuous Ampere
Phase	1 Phase
Frequency Rating	60 Hertz
Size	4.125L x 11W x 14.563H
Number Of Cutouts	0
Cutout Size	No Main Breaker
Cable Entry	Overhead
Terminal	Lay in
Insulation	Glass Polyester
Mounting	Surface Mount

Enclosure	G90 Galvanized Steel with Powder Coat Finish
Jaw Quantity	5 Terminal
Bypass Type	Horn Bypass
Number of Meter Positions	1 Position
Equipment Ground	Triplex Ground
Hub Opening	Small Hub Opening
Line Side Wire Range	6 AWG - 350 kcmil
Load Side Wire Range	6 AWG - 350 kcmil
Number Of Receptacles	0

Please consult serving utility for their requirements prior to ordering or installing, as specifications and approvals vary by utility and may require local electrical inspector approval. All installations must be installed by a licensed electrician and must comply with all national and local codes, laws and regulations. Milbank reserves the right to make changes in specifications and features shown without notice or obligation.

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COLORADO SPRINGS, CO, 80907

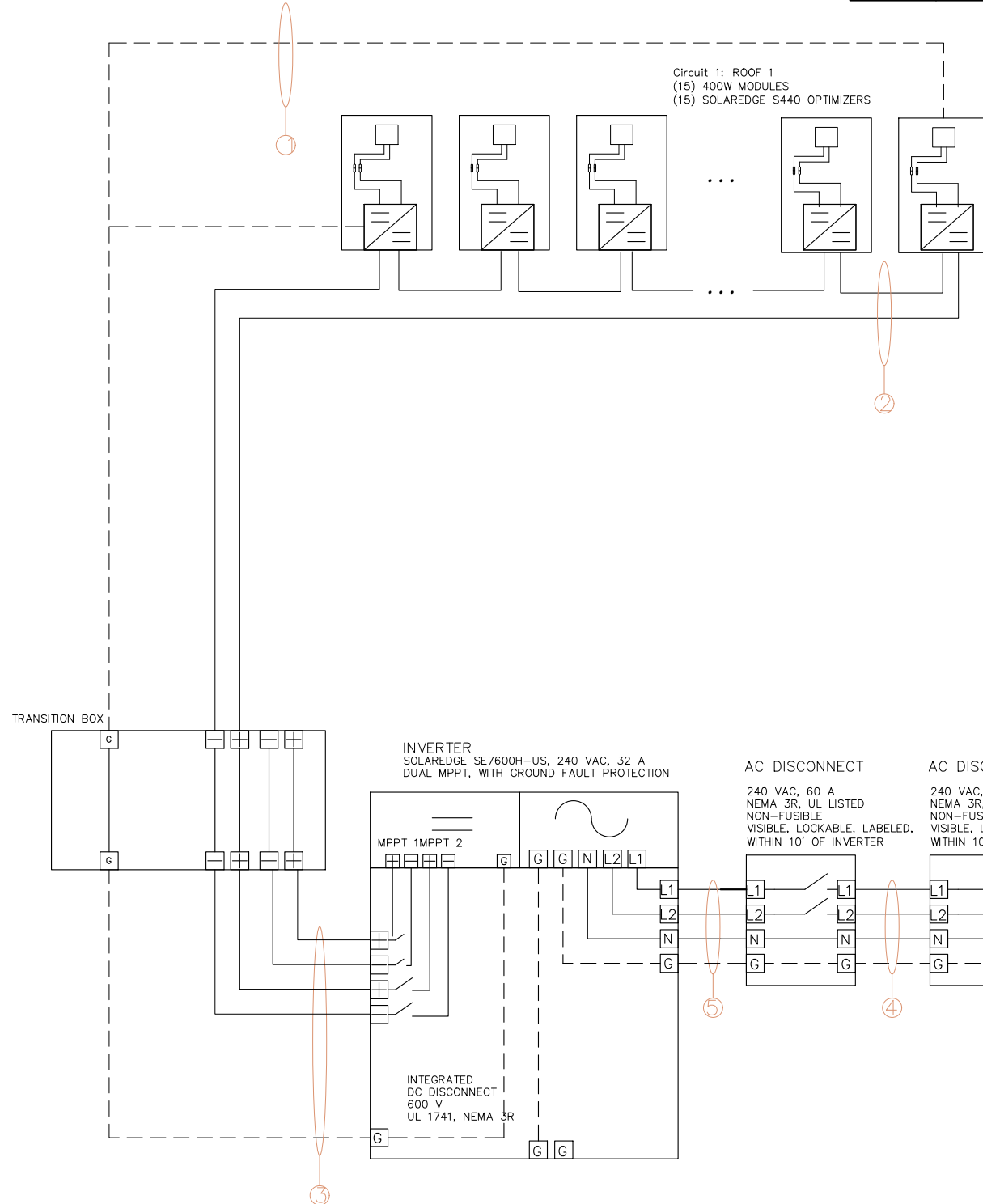
SHEET NAME
EQUIPMENT
SPECIFICATION
SHEETS

SHEET SIZE
11" x 17"

SHEET NUMBER
PV-7

PHOTOVOLTAIC ELECTRICAL DIAGRAM

CABLE SCHEDULE AND CALCS																
CIRCUIT I.D. #	SERVICE	QTY	CONDUCTOR SIZE	CONDUCTOR AMPACITY	CONDUCTOR MATERIAL	LONGEST LENGTH(FT)	CONDUCTOR INSULATION (80°C)	GROUND SIZE	GROUND QUANTITY	GROUND INSULATION	CONDUIT TYPE	CONDUIT FILL DERATE	CONDUIT SIZE	TEMP DERATE	DERATED AMPACITY	MAX CIRCUIT CURRENT
1	DC	0	-	-	-	-	-	AWG #G	1	BARE	FREE AIR	-	N/A	-	-	-
2	DC	2	AWG #10	40	CU	75	PV WIRE	AWG #G	-	-	EMT OR FREE AIR	1	3/4"	0.71	28.4A	15A
3	DC	4	AWG #10	40	CU	40	THWN-2	AWG #G	1	THWN-2	EMT OR FMC	0.8	3/4"	0.71	22.72A	15A
4	AC	3	AWG #6	75	CU	90	THWN-2	AWG #G	1	THWN-2	FREE-AIR	1	3/4"	0.71	68.25A	32A
5	AC	3	AWG #6	75	CU	10	THWN-2	AWG #G	1	THWN-2	EMT	1	3/4"	0.91	68.25A	32A



GENERAL NOTES:

1. INSTALLATION SHALL BE ACCORDING TO THE NATIONAL ELECTRIC CODE 2020 AND ALL STATE AND LOCAL STANDARDS AND CODES.
2. INSTALL LABELS ON ALL ENCLOSURES, INVERTERS, SWITCHES, LOAD CENTERS AS PER NEC.
3. AC DISCONNECT SHALL BE EXTERNALLY OPERATED KNIFE BLADE TYPE AND LOCKABLE IN BOTH ON AND OFF POSITIONS, AND DIRECTLY ACCESSIBLE TO UTILITY.
4. ALL ELECTRICAL WORK WILL COMPLY AND BE INSPECTED BY A LICENSED MASTER ELECTRICIAN AND ALL LOCAL CODE AUTHORITIES.
5. CONTRACTOR IS RESPONSIBLE FOR ENSURING INSTALLATION IS PER NEC & MANUFACTURER'S DESIGN SPEC.
6. ALL CONDUCTORS SHALL BE COPPER, RATED FOR 600V AND 90°C.
7. CONTINUOUS GROUND IS REQUIRED. IRREVERSIBLE COMPRESSION CLAMPS REQUIRED FOR ALL GROUND SPLICES.
8. SYSTEM COMPLIES WITH RAPID SHUTDOWN PER 2020 NEC. RAPID SHUTDOWN SIGNAGE SHALL BE INSTALLED, SEE SHEET E-2.

DESIGN & DRAFTING BY:
DANA HAJEDEMOS



REVISIONS

DESCRIPTION	DATE	REV
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PROJECT NAME

BAHR, PAOLO
1820 NORTH TEJON STREET
COLORADO SPRINGS, CO, 80907

SHEET NAME

ELECTRICAL
DIAGRAM

SHEET SIZE

11" x 17"

SHEET NUMBER

E-1

PHOTOVOLTAIC AC DISCONNECT
RATED AC OUTPUT CURRENT: 32 A
NOMINAL OPERATING AC VOLTAGE: 240 V

REQ'D BY: NEC 690.54 1
 APPLY TO:
 PV AC DISCONNECT

WARNING
TURN OFF PHOTOVOLTAIC AC
DISCONNECT PRIOR TO WORKING
INSIDE PANEL

REQ'D BY: NEC 110.27(C) 2
 APPLY TO:
 PV AC DISCONNECT

WARNING
DUAL POWER SOURCE
SECOND SOURCE IS PV SYSTEM

REQ'D BY: NEC 705.10 & NEC 690.56(B) 3
 MAIN SERVICE PANEL

WARNING
INVERTER OUTPUT CONNECTION
DO NOT RELOCATE THIS OVERCURRENT DEVICE.

REQ'D BY: NEC 705.12 (B)(3)(2) 4
 INTERCONNECTION BREAKER
 INVERTER OUTPUT CIRCUIT CONNECTIONS IN AGG PANEL

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

REQ'D BY: NEC 705.12 (B)(2)(3)(c) 5
 POINT OF INTERCONNECTION
 (MAIN SERVICE PANEL)

WARNING
POWER TO THIS SERVICE IS ALSO SUPPLIED FROM
ON-SITE PHOTOVOLTAIC GENERATION
SEE MAP FOR LOCATION OF MAIN AC DISCONNECT

REQ'D BY: NEC 705.10 3
 SEE PLACARD MAP AT RIGHT

WARNING
THIS DISCONNECTION OF THE
GROUNDING CONDUCTORS MAY
RESULT IN OVERVOLTAGE
ON THE EQUIPMENT

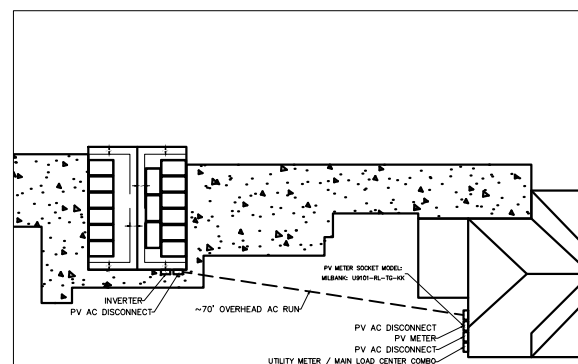
REQ'D BY: NEC 690.31(E) 6
 APPLY TO: N/A
 BIPOLAR PV SYSTEM

PV SYSTEM DC DISCONNECT
MAXIMUM DC VOLTAGE OF PV SYSTEM:
500 V DC

REQ'D BY: NEC 690.13(B) 7
 APPLY TO:
 INVERTER INTEGRATED DC DISCONNECT

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

REQ' BY: 706.15(C)(4) & 690.13(B) 8
 APPLY TO:
 POINTS OF CONNECTION



CAUTION
MULTIPLE SOURCES OF POWER.
POWER TO THIS BUILDING IS SUPPLIED
FROM THE FOLLOWING SOURCES
WITH DISCONNECTS LOCATED AS SHOWN

WARNING - ELECTRIC 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

REQ' BY: 690.13(B) AND 706.15(C)(4) 9
 APPLY TO:
 COMBINER BOXES, RECOMBINER BOXES, DC DISCONNECTS
 IF APPLICABLE

SOLAR PV DC CIRCUIT

REQ' BY: 690.31(O)(2) 10
 APPLY TO:
 SOLAR CONDUIT INSIDE ARRAY BOUNDARY

PHOTOVOLTAIC POWER SOURCE

REQ' BY: 690.31(D)(2) 11
 APPLY TO:
 SOLAR CONDUIT

WARNING - DO NOT DISCONNECT UNDER LOAD

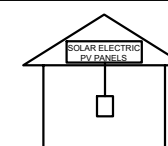
REQ' BY: 690.15(B) 12
 APPLY TO:
 MAIN SERVICE DISCONNECT

RAPID SHUTDOWN SWITCH
FOR SOLAR PV SYSTEM

REQ' BY: NEC 690.56(C)(2) 13
 APPLY TO:
 PV AC DISCONNECT

PHOTOVOLTAIC SYSTEM EQUIPPED
WITH RAPID SHUTDOWN

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



REQ' BY: NEC 690.56(C), IFC 604.11.3.1(1) 14
 BLACK ON YELLOW BACKGROUND
 APPLY TO: PV AC DISCONNECT

SIGNAGE REQUIREMENTS
 NEC 110.21(B)(1)
 ANSI Z535.4-2011 PROVIDES GUIDELINES FOR SUITABLE FONT SIZES, WORDS,
 COLORS, SYMBOLS, AND LOCATION REQUIREMENTS FOR LABELS.
 NEC 110.21(B)(3)
 IFC 605.11.1.3
 ADHESIVE FASTENED SIGNS MAY BE ACCEPTABLE IF PROPERLY ADHERED. VINYL
 SIGNS SHALL BE WEATHER RESISTANT.
 LABELS SHALL BE OF SUFFICIENT DURABILITY TO WITHSTAND ENVIRONMENT.

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SHEET NAME

SYSTEM
 LABELING
 DETAIL

SHEET SIZE

11" x 17"

SHEET NUMBER

E-2