

PROJECT DESCRIPTION

THIS ROOF MOUNTED SOLAR PHOTOVOLTAIC (PV) SYSTEM SHALL BE INSTALLED AT THE COMMERCIAL FACILITY IN DUBLIN, OH. THE ENERGY PRODUCED BY THIS PV SYSTEM SHALL BE INTERCONNECTED WITH THE UTILITY GRID THROUGH THE EXISTING ON-SITE ELECTRICAL EQUIPMENT VIA A LINE SIDE TAP IN THE MAIN PANEL. THIS SYSTEM DOES NOT INCLUDE STORAGE BATTERIES.

NOTES

- 1) ALL DIMENSIONS SHALL BE FIELD VERIFIED BY INSTALLER PRIOR TO INITIATING CONSTRUCTION.
- 2) ALL EQUIPMENT SHALL BE INSTALLED IN ACCORDANCE WITH THE MANUFACTURER'S INSTALLATION INSTRUCTIONS.
- 3) ALL EQUIPMENT SHALL BE LISTED FOR ITS SPECIFIC APPLICATION BY UL OR EQUIVALENT AGENCY.
- 4) ALL EQUIPMENT SHALL BE RATED FOR THE ENVIRONMENT IN WHICH IT IS INSTALLED.
- 5) ACCESS TO ELECTRICAL COMPONENTS OVER 150 VOLTS-TO-GROUND SHALL BE RESTRICTED TO QUALIFIED PERSONNEL.
- 6) ALL CONDUCTORS SHALL BE COPPER, RATED FOR 600 VOLTS AND 90 DEGREES C WET ENVIRONMENT, UNLESS OTHERWISE NOTED.
- 7) UNSPECIFIED EQUIPMENT DIMENSIONS SHALL BE DETERMINED ACCORDING TO APPLICABLE CODES UPON INSTALLATION.
- 8) PV MODULE FRAMES SHALL BE BONDED TO RACKING RAIL PER THE MODULE MANUFACTURE'S LISTED INSTRUCTION SHEET.
- 9) PV MODULE RACKING RAIL SHALL BE BONDED TO BARE COPPER GEC VIA WEEB LUG OR EQUIVALENT LISTED EQUIPMENT.
- 10) GROUNDING ELECTRODE CONDUCTOR (GEC) SHALL BE CONTINUOUS AND/OR IRREVERSIBLY SPICED/AWELDED.
- 11) ALL JUNCTION BOXES, COMBINER BOXES, AND DISCONNECTS SHALL BE INSTALLED IN ACCESSIBLE LOCATIONS.
- 12) WORKING SPACE AROUND ELECTRICAL EQUIPMENT SHALL COMPLY WITH 2017 NEC 110.26.

SCOPE OF WORK

- ELECTRICAL EQUIPMENT
- (134) JINKO JKM405M-72HL-V (3014 sq-ft)
 - (134) AP SMART RSD-S-PLC
 - (2) CPS SCA25KTL-DO/US208 INVERTER
 - (1) COMBINER LOAD CENTER
 - (1) EXT. AC DISCONNECT
 - (1) INDR. AC DISCONNECT - FUSED
 - (1) CPS METER

- MOUNTING AND RACKING
- (237) UNIRAC FLASH LOC
 - (48) UNIRAC END CLAMPS
 - (244) UNIRAC MID CLAMPS
 - (62) UNIRAC STANDARD RAIL (168 IN.)

SITE SPECIFICATIONS

BUILDING DISCRIP: COMMERCIAL FACILITY
 BUILDING TYPE: COMMERCIAL
 LANDSCAPE: SUBURBAN
 UTILITY: AEP OHIO
 AHJ:
 OCCUPANCY CATEGORY: II
 EXPOSURE CATEGORY: C
 DESIGN WIND SPEED: 115 MPH (ASCE 7-10)
 DESIGN SNOW LOAD: 20 PSF(ASCE 7-10)

GOVERNING CODES

2017 NATIONAL ELECTRIC CODE
 2017 OHIO BUILDING CODE
 2017 OHIO FIRE CODE
 2019 OHIO RESIDENTIAL CODE
 UNDERWRITERS LABORATORIES (UL) STANDARDS
 OSHA CFR 1910.272

REACH EDUCATIONAL SERVICE LLC
 4019 W DUBLIN GRANVILLE RD JAMES WOMEN
 CENTER, DUBLIN, OH 43017
 134 JINKO 405 - 54.3 KWSTC

PROJECT MANAGER: ADAM BROWN

PHONE: 740-249-4533 ext. 134

EMAIL: jbrown@thirdsunsolar.com

SOLAR CONSULTANT: JARROD STARR

SITE VISIT TECH: DAVID JOLLEY

DESIGN ENGINEER: KATHRYN BIGLER



762 W. UNION ST.
 ATHENS, OH 45701
 (740) 249-4533
 www.thirdsunsolar.com

PROJECT:
 REACH EDUCATIONAL SERVICE LLC
 4019 W DUBLIN GRANVILLE RD
 JAMES WOMEN CENTER
 DUBLIN, OH 43017

JOB NUMBER:
 21-0031

PROJECT DETAILS:
 54.3 kWstc, 50 kW AC



SHEET TITLE:
 COVER

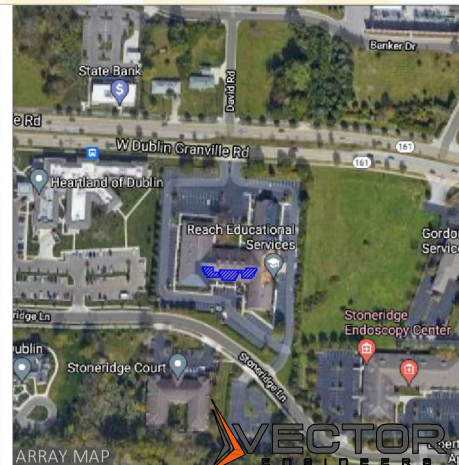
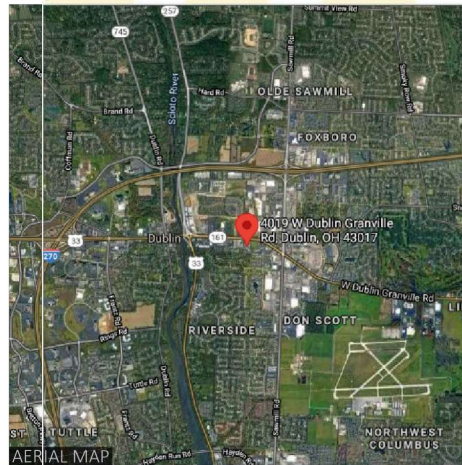
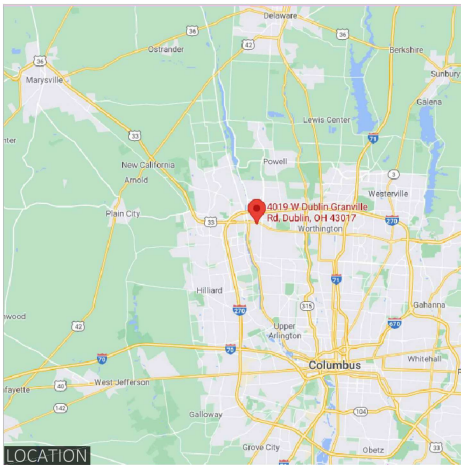
SHEET NUMBER:
 T1.0

SHEET SIZE:
 ANSI B (17.00 X 11.00 INCHES)

REVISIONS				
Description	Date	Int	Rev	
ORIGINAL	06/15/21	KB	0	
REV.A	06/23/21	KB	1	
REV.B	06/30/21	KB	2	
REV.C	07/06/21	KB	3	
REV.D	07/14/21	KB	4	

DRAFT:
 KATHRYN BIGLER

REVIEWED:



SHEET INDEX

- T1.0 COVER
- A1.0 SITE PLAN
- A1.1 PV LAYOUT
- A2.0 MOUNTING & RACKING
- E1.0 ELECTRICAL RISER
- E2.0 ELECTRICAL CALCS
- E3.0 SAFETY PLACARDS
- D1.0 PV MODULE DATASHEET
- D2.0 INVERTER DATASHEET
- D2.1 RSD DATASHEET
- D3.0 RACKING DATASHEET
- D4.0 GROUNDING DATASHEET
- D5.0 RGM DATASHEET

Vector Structural Engineering has reviewed the existing structure with loading from the solar array and screw connections to the existing framing. The design of the racking system, racking connections, and all other structural is by others, Mechanical, architectural, and all other non-structural aspects of this design are by others.

PROJECT:
 REACH EDUCATIONAL SERVICE LLC
 4019 W DUBLIN GRANVILLE RD
 JAMES WOMEN CENTER
 DUBLIN, OH 43017

JOB NUMBER:
 21-0031

PROJECT DETAILS:
 54.3 kWstc, 50 kW AC

ENGINEERING APPROVAL:

SHEET TITLE:
 SITE PLAN

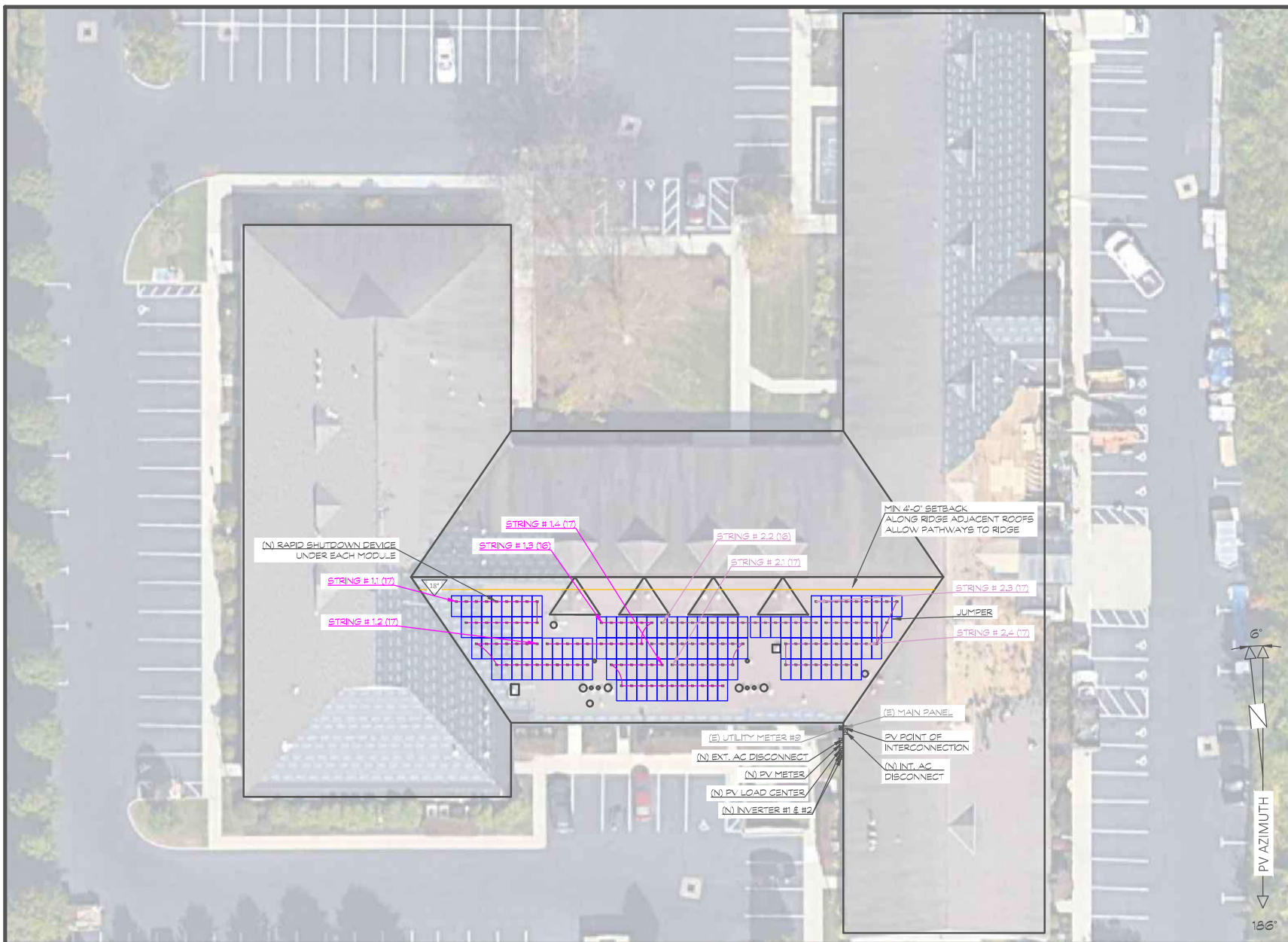
SHEET NUMBER:
 A1.0

SHEET SIZE:
 ANSI B (17.00 X 11.00 INCHES)

REVISIONS			
Description	Date	Int	Rev
ORIGINAL	06/15/21	KB	0
REV.A	06/23/21	KB	1
REV.B	06/30/21	KB	2
REV. C	07/06/21	KB	3
REV.D	07/14/21	KB	4

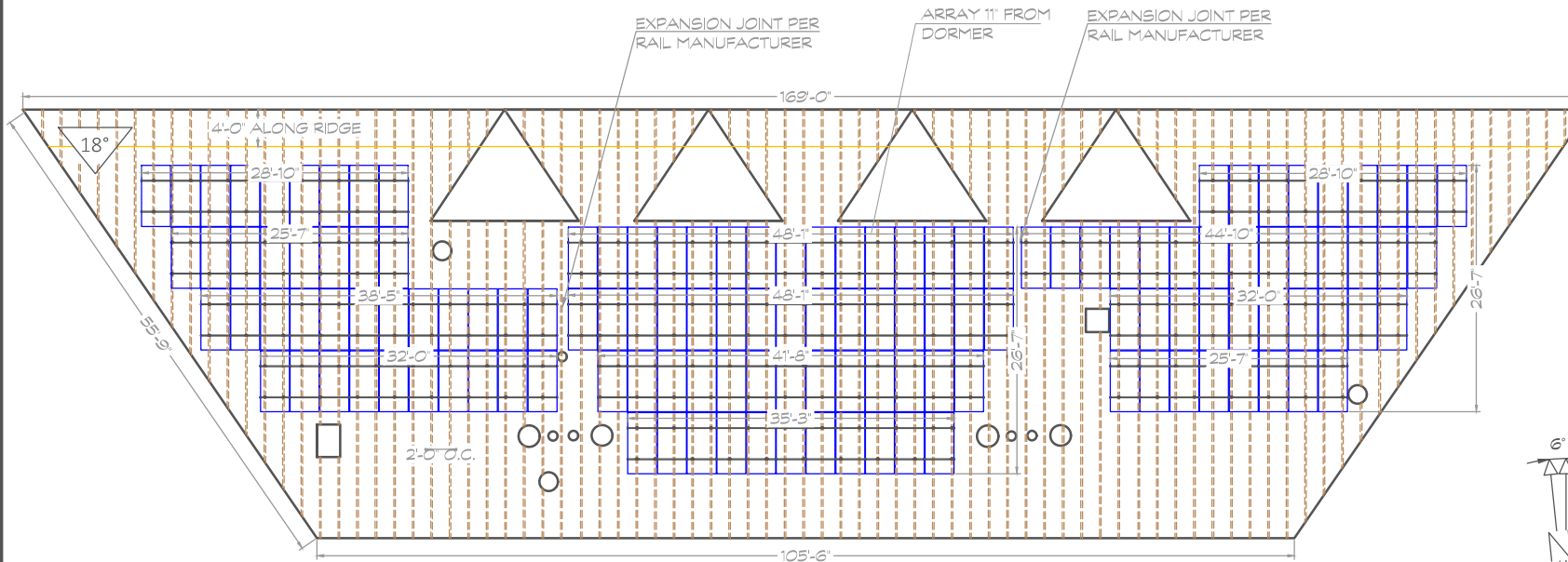
DRAFT:
 KATHRYN BIGLER

REVIEWED:



RACKING SCHEDULE		
UNIRAC FLASH LOC	237	COUNT
UNIRAC END CLAMPS	48	COUNT
UNIRAC MID CLAMPS	244	COUNT
UNIRAC STANDARD RAIL (168 IN.)	62	COUNT

ROOF LOAD CALCS							
	QTY		WEIGHT		TOTAL		
PV MODULE	134	X	49.6	LBS	=	6646	LBS
RACKING RAIL LN. FT.	861	X	0.85	LB/FT	=	732	LBS
CLAMPS	292	X	0.125	LBS	=	37	LBS
ATTACHMENTS	237	X	2	LBS	=	474	LBS
TOTAL WEIGHT					=	7889	LBS
ARRAY AREA					=	3014	SQFT
DEAD LOAD					=	2.62	LB/SQFT
POINT LOAD					=	33.29	LBS



THIRD SUN SOLAR
 762 W. UNION ST.
 ATHENS, OH 45701
 (740) 249-4533
 www.thirdsunsolar.com

PROJECT:
 REACH EDUCATIONAL SERVICE LLC
 4019 W DUBLIN GRANVILLE RD
 JAMES WOMEN CENTER
 DUBLIN, OH 43017

JOB NUMBER:
 21-0031

PROJECT DETAILS:
 54.3 kWstc, 50 kW AC

ENGINEERING APPROVAL

COLEMAN D. LARSEN
 81862
 07/14/2021

SHEET TITLE:
 PV LAYOUT

SHEET NUMBER:
 A1.1

SHEET SIZE:
 ANSI B (17.00 X 11.00 INCHES)

REVISIONS			
Description	Date	Int	Rev
ORIGINAL	06/15/21	KB	0
REV.A	06/23/21	KB	1
REV.B	06/30/21	KB	2
REV. C	07/06/21	KB	3
REV.D	07/14/21	KB	4

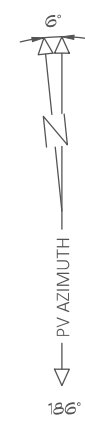
DRAFT:
 KATHRYN BIGLER

REVIEWED:

VECTOR ENGINEERS
 651 W. GALENA PARK BLVD. STE. 101 DRAPER, UTAH 84020 PHONE (801) 990-1775 WWW.VECTORS.E.COM

Firm License Number: 03392
 VSE Project Number: U2513-0239-211

Vector Structural Engineering has reviewed the existing structure with loading from the solar array and screw connections to the existing framing. The design of the racking system, racking connections, and all other structural is by others. Mechanical, architectural, and all other nonstructural aspects of the design are by others. Electrical is by others, unless stamped by Dean Levorsen.

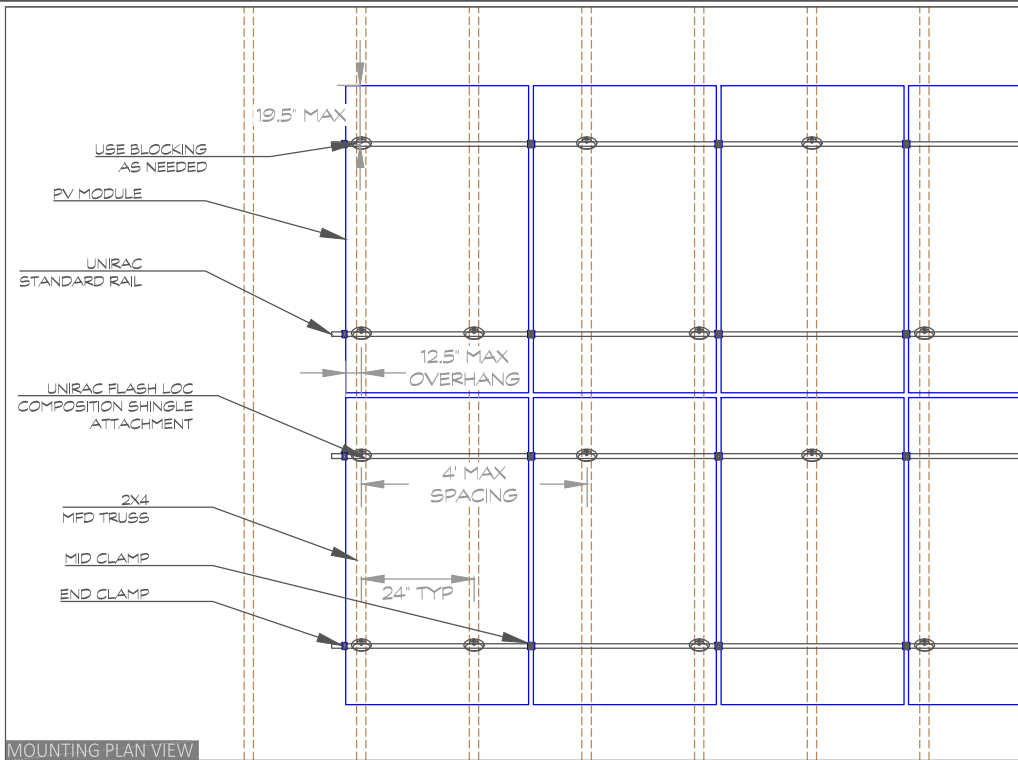


THIS PAGE DEPICTS A STANDARD RACKING METHOD FOR A COMPOSITION SHINGLE ROOF. INCLUDED ARE MAXIMUM MINIMUM AND TYPICAL DIMENSIONS. ACTUAL DIMENSIONS MAY VARY ON INSTALL BUT MAXIMUM AND MINIMUM DIMENSIONS SHALL NOT BE EXCEEDED

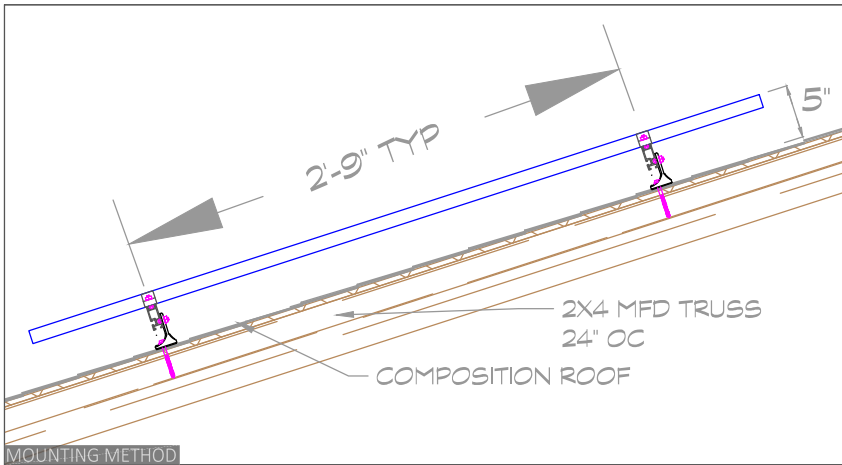


Firm License Number: 03392
VSE Project Number: U2513-0239-211

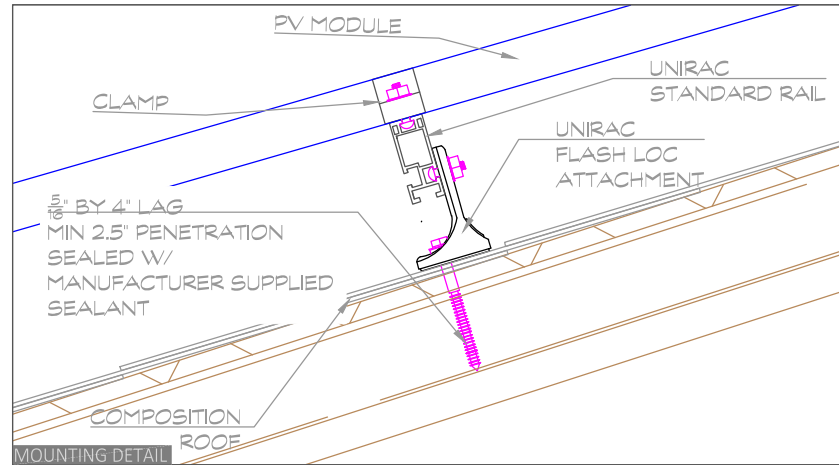
Vector Structural Engineering has reviewed the existing structure with loading from the solar array and screw connections to the existing framing. The design of the racking system, racking connections, and all other structural is by others. Mechanical, architectural, and all other nonstructural aspects of the design are by others. Electrical is by others, unless stamped by Dean Levorsen.



MOUNTING PLAN VIEW



MOUNTING METHOD



MOUNTING DETAIL

THIRD SUN SOLAR
762 W. UNION ST.
ATHENS, OH 45701
(740) 249-4533
www.thirdsunsolar.com

PROJECT:
REACH EDUCATIONAL SERVICE LLC
4019 W DUBLIN GRANVILLE RD
JAMES WOMEN CENTER
DUBLIN, OH 43017

JOB NUMBER:
21-0031

PROJECT DETAILS:
54.3 kWstc, 50 kW AC

ENGINEERING APPROVAL:

COLEMAN D. LARSEN
81862
07/14/2021

SHEET TITLE:
MOUNTING & RACKING

SHEET NUMBER:
A2.0

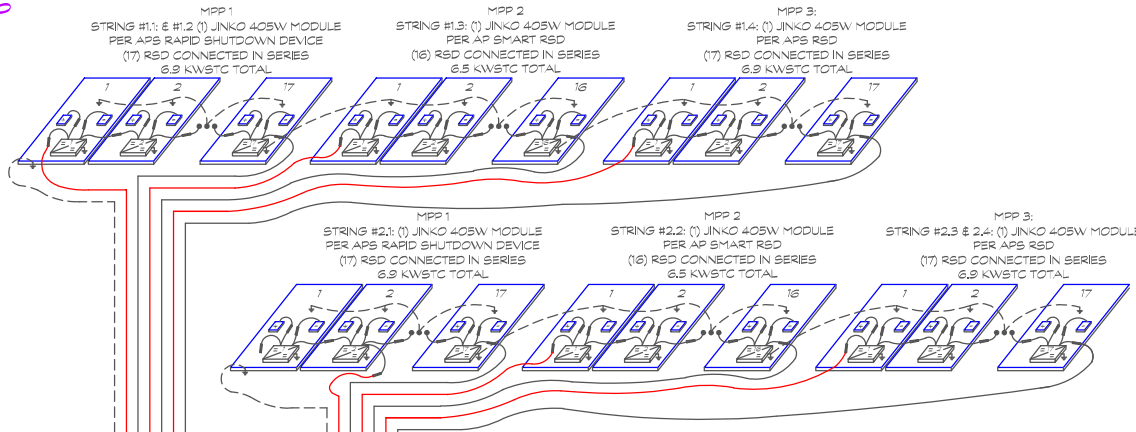
SHEET SIZE:
ANSI B (17.00 X 11.00 INCHES)

REVISIONS				
Description	Date	Int	Rev	
ORIGINAL	06/15/21	KB	0	
REV.A	06/23/21	KB	1	
REV.B	06/30/21	KB	2	
REV.C	07/06/21	KB	3	
REV.D	07/14/21	KB	4	

DRAFT:
KATHRYN BIGLER

REVIEWED:

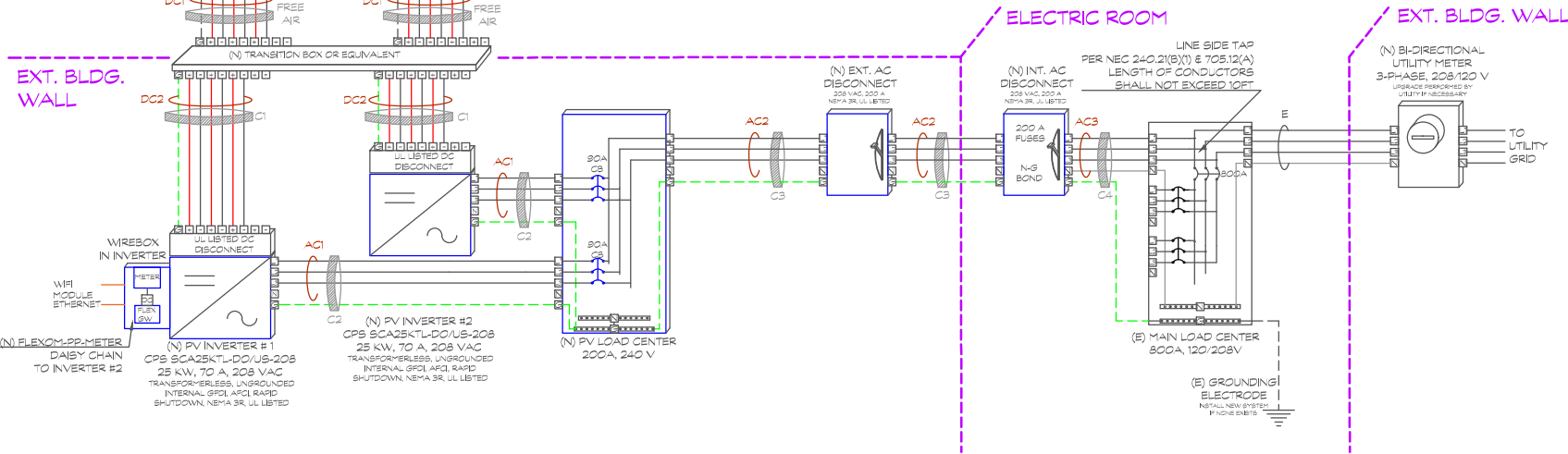
ROOFTOP



- NOTES:
 N = NEW
 E = EXISTING
 INT = INTERIOR
 EXT = EXTERIOR
 • MC CABLE OR FMC PERMITTED PER NEC 690.31
 • VERIFY SERVICES N-G COMPLIES WITH NEC 250
 • UNSPLICED COMBINED AC/DC GROUNDING CONDUCTOR PER NEC 690.47 INSTALLED PER NEC 250.64(E)



Firm License Number: 03392
 VSE Project Number: U2513.0239.211



MF	TAG	PHASE CONDUCTOR		EGC/GROUND/NEUTRAL CONDUCTOR PER 705.95(B)			EST. DIST. (ft)			
		QTY	MTL	SIZE	TYPE	SIZE		TYPE		
1	DC1	16	CU	AWG #10	PV Wire	1	CU	AWG #6	BARE	30
2	DC2	8	CU	AWG #10	PV Wire	1	CU	AWG #6	THWN-2	60

MF	TAG	PHASE CONDUCTOR		EGC/GROUND/NEUTRAL CONDUCTOR PER 705.95(B)			EST. DIST. (ft)			
		QTY	MTL	SIZE	TYPE	QTY		MTL	SIZE	TYPE
2	AC1	3	CU	AWG #2	THWN	1	CU	AWG #6	THWN	10
1	AC2	3	AL	AWG 4/0	THWN	1	CU	AWG #4	THWN	40
1	AC3	4	AL	AWG 4/0	THWN	1	CU	AWG #4	THWN	10

MF	TAG	SIZE	TYPE	EST. DIST. (ft)
2	C1	1.25"	EMT	60
1	C2	1.25"	EMT	10
1	C3	2.5"	EMT	40
1	C4	2.5"	EMT	10

THIRD SUN SOLAR
 762 W. UNION ST.
 ATHENS, OH 45701
 (740) 249-4533
 www.thirdsunsolar.com

PROJECT:
 REACH EDUCATIONAL SERVICE LLC
 4019 W DUBLIN GRANVILLE RD
 JAMES WOMEN CENTER
 DUBLIN, OH 43017

JOB NUMBER:
 21-0031

PROJECT DETAILS:
 54.3 kWstc, 50 kW AC

ENGINEERING APPROVAL:
ELECTRICAL ONLY

SHEET TITLE: 07/14/2021
 ELECTRICAL RISER

SHEET NUMBER:
 E1.0

SHEET SIZE:
 ANSI B (17.00 X 11.00 INCHES)

Description	Date	Int	Rev
ORIGINAL	06/15/21	KB	0
REV.A	06/23/21	KB	1
REV.B	06/30/21	KB	2
REV.C	07/06/21	KB	3
REV.D	07/14/21	KB	4

DRAFT:
 KATHRYN BIGLER

REVIEWED:

PROJECT:
 REACH EDUCATIONAL SERVICE
 LLC
 4019 W DUBLIN GRANVILLE RD
 JAMES WOMEN CENTER
 DUBLIN, OH 43017
 JOB NUMBER:
 21-0031

PROJECT DETAILS:
 54.3 kWstc, 50 kW AC

ENGINEERING APPROVAL:
ELECTRICAL ONLY



SHEET TITLE: **07/14/2021**
 SAFETY PLACARDS

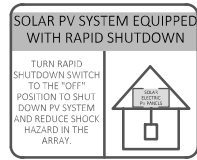
SHEET NUMBER:
 E3.0

SHEET SIZE:
 ANSI B (17.00 X 11.00 INCHES)

REVISIONS			
Description	Date	Int	Rev
ORIGINAL	06/15/21	KB	0
REV.A	06/23/21	KB	1
REV.B	06/30/21	KB	2
REV.C	07/06/21	KB	3
REV.D	07/14/21	KB	4

DRAFT:
 KATHRYN BIGLER

REVIEWED:



RAPID SHUTDOWN SWITCH FOR SOLAR PV SYSTEM

REQ'D BY: NEC 690.56(C)(3)
 APPLY TO:
 RAPID SHUTDOWN SWITCH
 *MUST BE REFLECTIVE
 ** MUST COMPLY WITH SIGNAGE REQUIREMENT BELOW

REQ'D BY: NEC 690.12(B)(2)(1), 690.56(C)(1)(a)
 APPLY TO:
 RAPID SHUTDOWN SWITCH

PHOTOVOLTAIC SYSTEM DC DISCONNECT

REQ'D BY: NEC 690.13(B)
 APPLY TO:
 DC DISCONNECT SWITCHES

PHOTOVOLTAIC POWER SOURCE AC DISCONNECT
OPERATING CURRENT: 3.39 AMPS
 OPERATING VOLTAGE: 208 VOLTS

REQ'D BY: NEC 690.13(B) & 690.54
 APPLY TO:
 AC DISCONNECT SWITCHES

PHOTOVOLTAIC SYSTEM
MAX CIRCUIT OUTPUT: 88 AMPS
 MAX SYSTEM VOLTAGE: 954 VOLTS

REQ'D BY: NEC 690.53
 APPLY TO:
 INVERTER #1, INVERTER #2 AND DC DISCONNECTS

WARNING: PHOTOVOLTAIC POWER SOURCE

REQ'D BY: NEC 690.31(G)(3)
 APPLY TO:
 DC CIRCUIT JUNCTION BOXES, RACEWAYS, CABLE TRAYS, CONDUIT BODIES WITHIN AVAILABLE OPENINGS, EVERY 10', WITHIN 1' OF TURNS/PENETRATIONS
 *MUST BE REFLECTIVE
 ** MUST COMPLY WITH SIGNAGE REQUIREMENT BELOW

THIS ELECTRIC SYSTEM IS ALSO SERVED BY A PHOTOVOLTAIC SYSTEM

REQ'D BY: NEC 705.12(D)(3)
 APPLY TO:
 ANY/ALL ELECTRICAL PANELS CONNECTED TO MULTIPLE POWER SOURCES



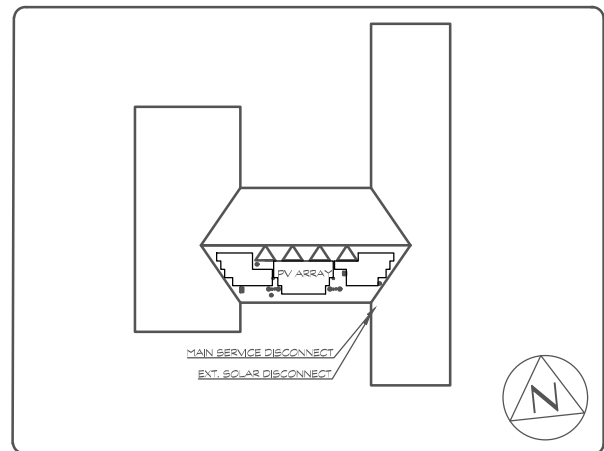
REQ'D BY: NEC 690.13(B)
 APPLY TO:
 DISCONNECTS, FUSES, CIRCUIT BREAKERS

THIS SITE CONTAINS A PHOTOVOLTAIC POWER SYSTEM SYSTEM DISCONNECT LOCATION:

REQ'D BY: NEC 705.22
 APPLY TO:
 APPLY NEAR SERVICE DISCONNECT IF NOT IN SAME LOCATION



REQ'D BY: NEC 705.12(B)(2)(3)(b)
 APPLY TO:
 PV BACKFED CIRCUIT BREAKER(S)



REQ'D BY: NEC 690.56 (B) & 705.10
 APPLY TO:
 APPLY NEAR SERVICE DISCONNECT & PV SYSTEM DISCONNECT IF NOT IN SAME LOCATION

VECTOR ENGINEERS
651 W. GALENA PARK BLVD. STE. 101 PHONE (801) 990-1775
 DRAPER, UTAH 84020 WWW.VECTOREE.COM
 Firm License Number: 03392
 VSE Project Number: U2513.0239.211

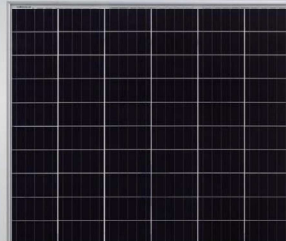
- SIGNAGE REQUIREMENTS**
- 1) RED BACKGROUND
 - 2) WHITE LETTERING
 - 3) MIN 3/8" LETTER HEIGHT
 - 4) ALL CAPITAL LETTERS
 - 5) ARIAL OR SIMILAR FONT
 - 6) WEATHER RESISTANT MATERIAL PER UL 969

Eagle HC 72M G2

390-410 Watt

MONO PERC HALF CELL MODULE

Positive power tolerance of 0~+3%

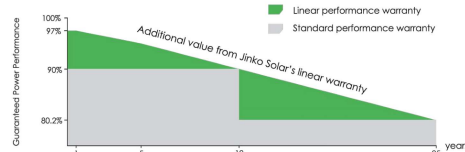


KEY FEATURES

- Diamond Cell Technology**
Uniquely designed high performance 5 busbar mono PERC half cell
- High Voltage**
UL and IEC 1500V certified; lowers BOS costs and yields better LCOE
- Higher Module Power**
Decrease in current loss yields higher module efficiency
- Shade Tolerance**
More shade tolerance due to twin arrays
- PID FREE**
Reinforced cell prevents potential induced degradation
- Strength and Durability**
Certified for high snow (5400 Pa) and wind (2400 Pa) loads

LINEAR PERFORMANCE WARRANTY

10 Year Product Warranty • 25 Year Linear Power Warranty



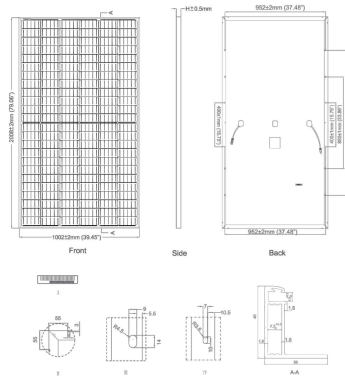
- ISO9001:2008 Quality Standards
- ISO14001:2004 Environmental Standards
- OHSAS18001 Occupational Health & Safety Standards
- IEC61215, IEC61730 certified products
- UL1703 certified products

Nomenclature: JKM410M-72HL-V

Code	Cell	Code	Cell	Code	Certification
null	Full	null	Normal	null	1000V
H	Half	L	Diamond	V	1500V



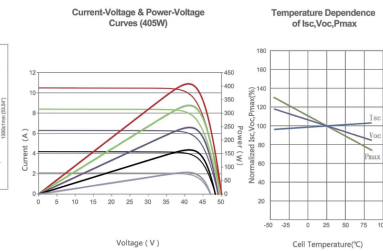
Engineering Drawings



Packaging Configuration

(Two pallets = One stack)
26pcs/pallet, 52pcs/stack, 572pcs/40'HQ Container

Electrical Performance & Temperature Dependence



Mechanical Characteristics

Cell Type	Mono PERC Diamond Cell (158.75 x 158.75 mm)
No. of Half-cells	144 (6x24)
Dimensions	2008x1002x40mm (79.06x39.45x1.57 inch)
Weight	22.5 kg (49.6 lbs)
Front Glass	3.2mm, Anti-Reflection Coating, High Transmission, Low Iron, Tempered Glass
Frame	Anodized Aluminium Alloy
Junction Box	IP67 Rated
Output Cables	12AWG, (+) 1400mm(55.12 in), (-) 1400mm(55.12 in) or Customized Length
Fire Type	Type 1

SPECIFICATIONS

Module Type	JKM390M-72HL-V		JKM395M-72HL-V		JKM400M-72HL-V		JKM405M-72HL-V		JKM410M-72HL-V	
	STC	NOCT	STC	NOCT	STC	NOCT	STC	NOCT	STC	NOCT
Maximum Power (Pmax)	390Wp	294Wp	395Wp	298Wp	400Wp	302Wp	405Wp	308Wp	410Wp	310Wp
Maximum Power Voltage (Vmp)	41.1V	39.1V	41.4V	39.3V	41.7V	39.6V	42.0V	39.8V	42.3V	40.0V
Maximum Power Current (Imp)	9.49A	7.54A	9.55A	7.60A	9.60A	7.66A	9.65A	7.72A	9.69A	7.76A
Open-circuit Voltage (Voc)	49.3V	48.0V	49.5V	48.2V	49.8V	48.5V	50.1V	48.7V	50.4V	48.9V
Short-circuit Current (Isc)	10.12A	8.02A	10.23A	8.09A	10.36A	8.16A	10.48A	8.22A	10.60A	8.26A
Module Efficiency STC (%)	19.38%		19.63%		19.88%		20.13%		20.38%	
Operating Temperature (°C)	-40°C~+85°C									
Maximum System Voltage	1500VDC(UL)/1500VDC(IEC)									
Maximum Series Fuse Rating	20A									
Power Tolerance	0~+3%									
Temperature Coefficients of Pmax	-0.38%/°C									
Temperature Coefficients of Voc	-0.28%/°C									
Temperature Coefficients of Isc	0.048%/°C									
Nominal Operating Cell Temperature (NOCT)	45±2°C									

STC: ☀ Irradiance 1000W/m² 🌡 Cell Temperature 25°C ☁ AM=1.5

NOCT: ☀ Irradiance 800W/m² 🌡 Ambient Temperature 20°C ☁ AM=1.5 🌀 Wind Speed 1m/s

* Power measurement tolerance: ± 3%

CAUTION: READ SAFETY AND INSTALLATION INSTRUCTIONS BEFORE USING THE PRODUCT.
© Jinko Solar Co., Ltd. All rights reserved. Specifications included in this datasheet are subject to change without notice.
JKM390-410M-72HL-V-A1-US



THIRD SUN SOLAR
762 W. UNION ST.
ATHENS, OH 45701
(740) 249-4533
www.thirdsunsolar.com

PROJECT:
REACH EDUCATIONAL SERVICE LLC
4019 W DUBLIN GRANVILLE RD
JAMES WOMEN CENTER
DUBLIN, OH 43017

JOB NUMBER:
21-0031

PROJECT DETAILS:
54.3 kW/stc, 50 kW AC

ENGINEERING APPROVAL:

SHEET TITLE:
PV MODULE DATASHEET

SHEET NUMBER:
D1.0

SHEET SIZE:
ANSI B (17.00 X 11.00 INCHES)

REVISIONS			
Description	Date	Int	Rev
ORIGINAL	06/15/21	KB	0
REV.A	06/23/21	KB	1
REV.B	06/30/21	KB	2
REV.C	07/06/21	KB	3
REV.D	07/14/21	KB	4

DRAFT:
KATHRYN BIGLER

REVIEWED:



Datasheet

25kW 208V, 1000Vdc String Inverters for North America

The 25kW (25kVA) CPS three phase string inverters are designed for rooftop and carport applications. The units are high performance, advanced and reliable inverters designed specifically for the North American environment and grid. High efficiency at 97.0% peak and 96.5% CEC, wide operating voltages, broad temperature ranges and a NEMA Type 4X enclosure enable this inverter platform to operate at high performance across many applications. The CPS 25KTL product ships with the Rapid Shutdown wire-box, fully integrated and separable with touch safe fusing, monitoring, and AC and DC disconnect switches. The integrated PLC transmitter in the Rapid Shutdown wire-box enables PVRSS certified module-level rapid shutdown when used with the APS RSD-S-PLC-A products. The CPS Flex Gateway enables monitoring, controls and remote product upgrades.



CPS SCA25KTL-DO/US-208

Key Features

- NEC 2017/2020 PVRSS Certified Rapid Shutdown
- NEC 2017 compliant & UL listed Arc-Fault circuit protection
- 15-90° Mounting orientation for low profile roof installs
- Optional Flex Gateway enables remote FW upgrades
- Integrated AC & DC disconnect switches
- 3 MPPT's with 2 inputs each for maximum flexibility
- Copper and Aluminum compatible AC connections
- NEMA Type 4X outdoor rated, tough tested enclosure
- UL1741 SA Certified to CA Rule 21, including SA14 FW and SA15 VW
- Separable wire-box design for fast service
- Standard 10 year warranty with extensions to 20 years
- Generous 1.8 DC/AC Inverter Load Ratio



25KTL Rapid Shutdown Wire-box



© CHINT POWER SYSTEMS AMERICA 2020/10-MKT-NA

Chint Power Systems America
6800 Koll Center Parkway, Suite 235 Pleasanton, CA 94566
Tel: 855-584-7168 Mail: AmericaSales@chintpower.com Web: www.chintpowersystems.com



Technical Data

Model Name	CPS SCA25KTL-DO/US-208
DC Input	
Max. PV Power	45kW (17kW per MPPT)
Max. DC Input Voltage	1000Vdc
Operating DC Input Voltage Range	200-950Vdc
Start-up DC Input Voltage / Power	330V / 80W
Number of MPP Trackers	3
MPPT Voltage Range @ PF>0.99	480-850Vdc
Max. PV Short-Circuit Current (Isc x 1.25)	135A (45A per MPPT)
Number of DC Inputs	6 inputs, 2 per MPPT
DC Disconnection Type	Load-rated DC switch
DC Surge Protection	Type II MOV, 2800V _C , 20kA I _{RM} (8/20...S)
AC Output	
Rated AC Output Power @ PF>0.99	25kW
Max. AC Apparent Power (Selectable)	25kVA
Rated Output Voltage	208Vac
Output Voltage Range ¹	183 - 228Vac
Grid Connection Type	3Φ / PE / N (Neutral optional)
Max. AC Output Current @208Vac	69.5A
Rated Output Frequency	60Hz
Output Frequency Range ¹	57 - 63Hz
Power Factor	>0.99 (±0.8 adjustable)
Current THD @ Rated Load	<3%
Max. Fault Current Contribution (1 Cycle RMS)	64.1A (0.92 PU)
Max. OCPD Rating	125A
AC Disconnection Type	Load-break rated AC switch
AC Surge Protection	Type II MOV, 1240V _C , 15kA I _{RM} (8/20...S)
System and Performance	
Topology	Transformerless
Max. Efficiency	97.0%
CEC Efficiency	96.5%
Stand-by / Night Consumption	<3W
Environment	
Enclosure Protection Degree	NEMA Type 4X
Cooling Method	Variable speed cooling fans
Operating Temperature Range ²	-22°F to +140°F / -30°C to +60°C
Non-Operating Temperature Range ³	No low temp minimum to +158°F / +70°C maximum
Operating Humidity	0 to 100%
Operating Altitude	13,123.4ft / 4000m (derating from 9842.5ft / 3000m)
Audible Noise	<60dBA @ 1m and 25°C
Display and Communication	
User Interface and Display	LCD+LED
Inverter Monitoring	SunSpec, Modbus RS485
Site Level Monitoring	CPS Flex Gateway (1 per 32 inverters)
Modbus Data Mapping	CPS
Remote Diagnostics / FW Upgrade Functions	Standard / (with Flex Gateway)
Mechanical	
Dimensions (HxWxD)	39.4 x 23.6 x 10.24in. (1000 x 600 x 260mm)
Weight	Inverter: 123.5lbs/56kg; Wire-box: 33lbs/15kg
Mounting / Installation Angle ⁴	15 to 90 degrees from horizontal (vertical or angled)
AC Termination	M8 Stud Type Terminal Block (Wire range: #6 - 3/0AWG CU/AL, Lugs not supplied)
DC Termination ⁵	Screw Clamp, Neg. Busbar ⁶ Wire range: #14 - #6AWG CU
Fused String Inputs (2 per MPPT) ⁶	20A fuses provided (Fuse values up to 30A acceptable)
Safety	
Certifications and Standards	UL1741SA-2016, UL1699B, UL1998, CSA-C22.2 NO.107.1-01, IEEE1547a-2014, FCC PART15
Selectable Grid Standard	IEEE 1547, CA Rule 21, ISO-NE, HECO
Smart-Grid Features	Volt-RideThru, Freq-RideThru, Ramp-Rate, Specified-PF, Volt-VAr, Freq-Watt, Volt-Watt
Warranty	
Standard	10 years
Extended Terms	15 and 20 years

1) The "Output Voltage Range" and "Output Frequency Range" may differ according to the specific grid standard.
2) Active Power Derating begins: at 45°C when PF=1 and MPPT 20min, and at 60°C when PF=1 and MPPT V ≥ 700Vdc.
3) See user manual for further requirements regarding non-operating conditions.
4) Shade Cover accessory required for installation angles of 75 degrees or less.
5) RSD wire-box only includes fuses/fuseholders on the positive polarity, compliant with NEC 2017, 690.9 (C).
6) Fuse values above 20A have additional spacing requirements or require the use of the Y-Comb Terminal Block. See user manual for details.



762 W. UNION ST.
ATHENS, OH 45701
(740) 249-4533
www.thirdsunsolar.com

PROJECT:
REACH EDUCATIONAL SERVICE LLC
4019 W DUBLIN GRANVILLE RD
JAMES WOMEN CENTER
DUBLIN, OH 43017

JOB NUMBER:
21-0031

PROJECT DETAILS:
54.3 kWstc, 50 kW AC

ENGINEERING APPROVAL:

SHEET TITLE:
INVERTER DATASHEET

SHEET NUMBER:
D2.0

SHEET SIZE:
ANSI B (17.00 X 11.00 INCHES)

REVISIONS			
Description	Date	Int	Rev
ORIGINAL	06/15/21	KB	0
REV.A	06/23/21	KB	1
REV.B	06/30/21	KB	2
REV.C	07/06/21	KB	3
REV.D	07/14/21	KB	4

DRAFT:
KATHRYN BIGLER

REVIEWED:



Raising the bar in innovative DC MLPE solar power systems

RSD-S-PLC

- Meets NEC 2017 & 2020 (690.12) requirements
- Executes rapid shutdown of system when Transmitter-PLC signal is absent
- Meets SunSpec requirements

RSD-S-PLC Technical Data

Model	RSD-S-PLC
Input Data (DC)	
Input Operating Voltage Range	8-80V
Maximum Cont. Input Current (Imax)	15A
Output Data (DC)	
Output Operating Voltage Range	8-80V
Maximum System Voltage	1000V/1500V
Mechanical Data	
Operating Ambient Temperature Range	-40 °F to +185 °F (-40 °C to + 85 °C)
Dimensions (without cable & connectors)	5" x 1.2" x 0.6"(129 mm x 30 mm x 16 mm)
Cable Length	Input 250mm/Output 1200mm
Cable Cross Section Size	TUV:4mm ² /UL:12AWG
Connector	MC4 or Customize
Enclosure Rating	NEMA Type 6P/IP68
Over Temperature Protection	Yes
Features & Compliance	
Communication	PLC
Safety Compliance	NEC 2017 & 2020 (690.12); UL1741; CSA C22.2 No. 330-17; IEC/EN62109-1; 2PFG2305
EMC Compliance	FCC Part15; ICES-003;IEC/EN61000-6-1/-2/-3/-4

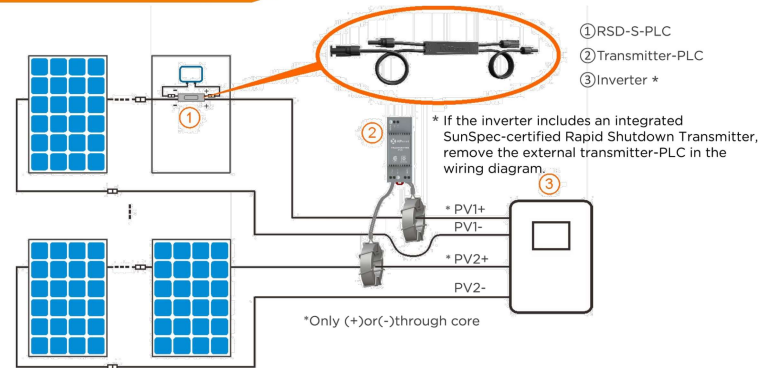
© All Rights Reserved

REV 2.2 2021-3-27

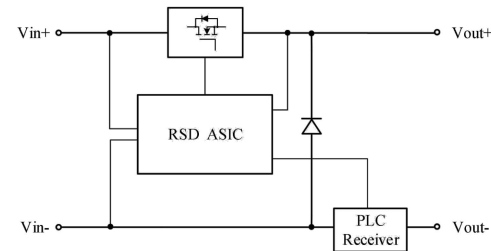


The RSD-S-PLC meets SunSpec requirements, maintaining normal function by continually receiving a heartbeat signal from the APsmart Transmitter. The RSD executes rapid system shutdown when the Transmitter signal is absent. Users can manually execute rapid shutdown using Transmitter breaker switch.

RSD-S-PLC Wiring Diagram



Working Schematic Diagram



ORDERING INFORMATION

415002	1500V UL/1000V TUV, 1.2m cable, MC4
415001	1000V UL/TUV, 1.2m cable, Customized connector



600 Ericksen Ave NE, Suite 200 Seattle, WA 98110 | +1-737-218-8486 | +1-866-374-8538 | support@APsmartGlobal.com | APsmartGlobal.com



REV 2.2 2021-3-27



762 W. UNION ST.
ATHENS, OH 45701
(740) 249-4533
www.thirdsunsolar.com

PROJECT:
REACH EDUCATIONAL SERVICE LLC
4019 W DUBLIN GRANVILLE RD
JAMES WOMEN CENTER
DUBLIN, OH 43017

JOB NUMBER:
21-0031

PROJECT DETAILS:
54.3 kWstc, 50 kW AC

ENGINEERING APPROVAL:

SHEET TITLE:
RSD DATASHEET

SHEET NUMBER:
D2.1

SHEET SIZE:
ANSI B (17.00 X 11.00 INCHES)

REVISIONS			
Description	Date	Int	Rev
ORIGINAL	06/15/21	KB	0
REV.A	06/23/21	KB	1
REV.B	06/30/21	KB	2
REV. C	07/06/21	KB	3
REV.D	07/14/21	KB	4

DRAFT:
KATHRYN BIGLER

REVIEWED:

SOLARMOUNT



OPTIMIZED COMPONENTS

INTEGRATED BONDING & PRE-ASSEMBLED PARTS

Components are pre-assembled and optimized to reduce installation steps and save labor time. Our new grounding & bonding process eliminates copper wire and grounding straps or bonding jumpers to reduce costs. Utilize the microinverter mount with a wire management clip for an easier installation.

VERSATILITY

ONE PRODUCT - MANY APPLICATIONS

Quickly set modules flush to the roof or at a desired tilt angle. Change module orientation to portrait or landscape while securing a large variety of framed modules on flat, low slope or steep pitched roofs. Available in mill, clear and dark anodized finishes to outperform your projects financial and aesthetic aspirations.

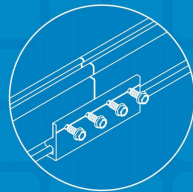
AUTOMATED DESIGN TOOL

DESIGN PLATFORM AT YOUR SERVICE

Creating a bill of materials is just a few clicks away with U-Builder, a powerful online tool that streamlines the process of designing a code compliant solar mounting system. Save time by creating a user profile, and recall preferences and projects automatically when you log in. You will enjoy the ability to share projects with customers: there's no need to print results and send to a distributor, just click and share.



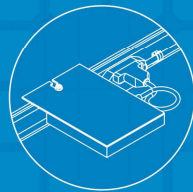
INTEGRATED BONDING MIDCLAMP



INTEGRATED BONDING SPLICE BAR



INTEGRATED BONDING L-FOOT w/ T-BOLT



INTEGRATED BONDING MICROINVERTER MOUNT w/ WIRE MANAGEMENT



UNIRAC CUSTOMER SERVICE MEANS THE HIGHEST LEVEL OF PRODUCT SUPPORT

UNMATCHED EXPERIENCE	CERTIFIED QUALITY	ENGINEERING EXCELLENCE	BANKABLE WARRANTY	DESIGN TOOLS	PERMIT DOCUMENTATION
----------------------	-------------------	------------------------	-------------------	--------------	----------------------

TECHNICAL SUPPORT

Unirac's technical support team is dedicated to answering questions & addressing issues in real time. An online library of documents including engineering reports, stamped letters and technical data sheets greatly simplifies your permitting and project planning process.

CERTIFIED QUALITY PROVIDER

Unirac is the only PV mounting vendor with ISO certifications for 9001:2008, 14001:2004 and OHSAS 18001:2007, which means we deliver the highest standards for fit, form, and function. These certifications demonstrate our excellence and commitment to first class business practices.

BANKABLE WARRANTY

Don't leave your project to chance. Unirac has the financial strength to back our products and reduce your risk. Have peace of mind knowing you are receiving products of exceptional quality. SOLARMOUNT is covered by a 10 year limited product warranty and a 5 year limited finish warranty.

PROTECT YOUR REPUTATION WITH QUALITY RACKING SOLUTIONS BACKED BY ENGINEERING EXCELLENCE AND A SUPERIOR SUPPLY CHAIN
PLACEMENTS: PRINTED UPDATE

FLASH LOC

INSTALLATION GUIDE



PRE-INSTALL

Snap chalk lines for attachment rows. On shingle roofs, snap lines 1-3/4" below upslope edge of shingle course. Locate rafters and mark attachment locations.

At each location, drill a 7/32" pilot hole. Clean roof surface of dirt, debris, snow, and ice, then fill pilot hole with sealant.

NOTE: Space mounts per racking system install specifications. When down pressure is ≥ 34 psf, span may not exceed 2 ft.



STEP 1: SECURE

Place FLASHLOC over pilot hole with lag on down-slope side. Align indicator marks on sides of mount with chalk line. Pass included lag bolt and sealing washer through FLASHLOC into pilot hole. Drive lag bolt until mount is held firmly in place.

NOTE: The EPDM in the sealing washer will expand beyond the edge of the metal washer when proper torque is applied.



STEP 2: SEAL

Insert tip of UNIRAC provided sealant into port. Inject until sealant exits both vents.

Continue array installation, attaching rails to mounts with provided T-bolts.

NOTE: When FLASHLOC is installed over gap between shingle or tabs or vertical joints, fill gap/joint with sealant between mount and upslope edge of shingle course.

USE ONLY UNIRAC APPROVED SEALANTS: Chemlink Duralink 50 (included in kit) or Chemlink M-1

FASTER INSTALLATION. 25-YEAR WARRANTY.

FOR QUESTIONS OR CUSTOMER SERVICE VISIT UNIRAC.COM OR CALL (505) 248-2702

762 W. UNION ST.
 ATHENS, OH 45701
 (740) 249-4533
 www.thirdsunsolar.com

PROJECT:	REACH EDUCATIONAL SERVICE LLC
	4019 W DUBLIN GRANVILLE RD
	JAMES WOMEN CENTER
	DUBLIN, OH 43017

JOB NUMBER:	21-0031
-------------	---------

PROJECT DETAILS:	54.3 kWstc, 50 kW AC
------------------	----------------------

ENGINEERING APPROVAL:	
-----------------------	--

SHEET TITLE:	RACKING DATASHEET
--------------	-------------------

SHEET NUMBER:	D3.0
---------------	------

SHEET SIZE:	ANSI B (17.00 X 11.00 INCHES)
-------------	-------------------------------

REVISIONS			
Description	Date	Int	Rev
ORIGINAL	06/15/21	KB	0
REV.A	06/23/21	KB	1
REV.B	06/30/21	KB	2
REV.C	07/06/21	KB	3
REV.D	07/14/21	KB	4

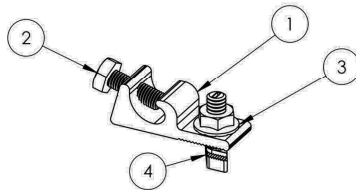
DRAFT:	KATHRYN BIGLER
--------	----------------

REVIEWED:	
-----------	--



Grounding Lug

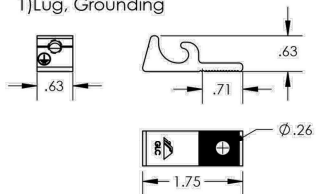
THIRD SUN SOLAR
 762 W. UNION ST.
 ATHENS, OH 45701
 (740) 249-4533
 www.thirdsunsolar.com



ITEM NO.	DESCRIPTION
1	LUG, GROUNDING, LAY-IN - LOW PROFILE
2	BOLT, 1/4-28 X .750" HEX CS SST
3	NUT, FLANGE HEX 1/4-20 SST
4	BOLT, T CSTM 1/4-20 X 1.188" LOCK SS

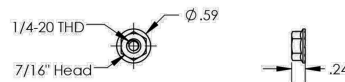
Part Number	Description	Wire Size Range (AWG)
XR-LUG-03-A1	GROUNDING LUG, LOW PROFILE	4-10

1) Lug, Grounding



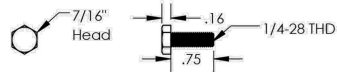
Property	Value
Material	Tin Plated Copper
Finish	Clear Matte

3) Nut, Flange Hex 1/4-20



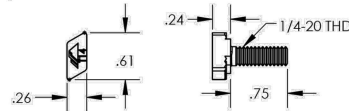
Property	Value
Material	300 Series Stainless Steel
Finish	Clear

2) Bolt, 1/4-28 x .750 Hex



Property	Value
Material	300 Series Stainless Steel
Finish	Clear

4) Bolt, T CSTM 1/4-20 x .750



Property	Value
Material	300 Series Stainless Steel
Finish	Clear

v1.10

PROJECT:
 REACH EDUCATIONAL SERVICE LLC
 4019 W DUBLIN GRANVILLE RD
 JAMES WOMEN CENTER
 DUBLIN, OH 43017

JOB NUMBER:
 21-0031

PROJECT DETAILS:
 54.3 kWstc, 50 kW AC

ENGINEERING APPROVAL:

SHEET TITLE:
 GROUNDING DATASHEET

SHEET NUMBER:
 D4.0

SHEET SIZE:
 ANSI B (17.00 X 11.00 INCHES)

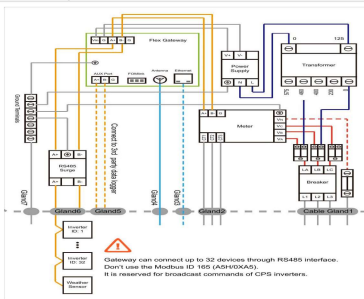
REVISIONS			
Description	Date	Int	Rev
ORIGINAL	06/15/21	KB	0
REV.A	06/23/21	KB	1
REV.B	06/30/21	KB	2
REV. C	07/06/21	KB	3
REV.D	07/14/21	KB	4

DRAFT:
 KATHRYN BIGLER

REVIEWED:



Model Name	FlexOM-PP-Meter	FlexOM-PP-Meter-4G
BOM List		
NEMA4 type enclosure		×
Wall & pole mounting accessories	×	×
Breaker	×	×
3P, 600V		
Transformer	×	×
600/480/240/208V Primary, 110V Secondary		
AC-DC power supply	×	×
85-264 VAC input, 12V output, 40W		
RS485 Surge	×	×
24V		
Flex Gateway	×	×
Includes 4G module, WiFi optional		
Data plan (AT&T and T-Mobile)		×
5 years for 32 devices in a daisy chain		
Revenue meter	×	×
Wattnode		
CPS Flex Gateway		
Inverters to Gateway	Modbus®RS485	
Gateway to Portal	Ethernet	
Inverter connections per card	1 - 32	
Protocols	SunSpec XML HTTPS, CPS Modbus® RTU	
Local Programming	Wi-Fi to CPS Connect Phone App (iOS and Android)	
Data sampling rate	Programmable data sampling (1 to 20 minute sample rate)	
Local data storage	30 days based on 15 minute intervals	
Data parameters	Modbus®ID, Inverter S/N's, Model, Tyield/Dyield(kWh), Eff(%), PF, Pmax(kW), Pac(kW), Sac(kVA), Uabc(V), Iabc(A), Upv(V), Ipv(A), Freq(Hz), Mode, Time, Event	
Revenue-grade Meter		
Meter Type	WattNode Revenue-grade Wide-Range Modbus® Meter	
Input Voltage	Line powered from 3Phs, 208/240/480/600 Vac, 60Hz	
Communication protocol	Modbus® RTU RS485	
Measurement Accuracy	ANSI C12.20 class 0.5 and ANSI C12.1	
Update Rate	Approximately 0.1 second	
Startup Time	≤ 1 second after the supply voltage is applied	
Monitoring		
Interface	CPS Web-based Customer Facing Portal	
Inverter Controls	On/Off, PF control, Active Power curtailment, Remote Arc-Fault reset	
Inverter Data parameters	Pac(kW), Uabc(V), Iabc(A), Upv(V), Ipv(A), Temp(C), Tprod, Tref	
Site-Level Production	Energy(kWh) Day, Month, Year	
Real-time or Daily Notification	Status, Warning, Protect, Fault	
Commissioning Reports	System info: Site address, Installation date, Rated AC/DCkW Inverter info: Model, S/N, FW, V/F Relay settings, Performance	
Production Reports	Modbus ID, Inverter S/N's, Model, Tyield/Dyield(kWh), Eff(%), PF, Pmax(kW), Pac(kW), Sac(kVA), Uabc(V), Iabc(A), Upv(V), Ipv(A), Freq(Hz), Mode, Time, Event	
Environment		
Operating Temperature Range	-40°C ~ 60°C (-40°F ~ 140°F)	
Relative Humidity	4% to 100%	
Max. Operating Altitude	4,000 m (13,123 ft.)	
Mechanical Parameters (Meter Enclosure)		
Dimensions (HxWxD)	350 x 550 x 190 mm	
Weight	12 kg	
Protection Degree	NEMA 4 / IP65	
Installation Options	Wall Mounting, Pole Mounting	



Chint Power Systems America
6800 Koll Center Parkway Suite 235
Pleasanton, CA 94566

October 28th, 2020

Subject: CPS FlexOM-PP-Meter CT Selection

The CPS FlexOM-PP-Meter and FlexOM-PP-Meter-4G solutions do not include CTs since the current and accuracy requirement can vary from site to site making it necessary for specific CTs to be purchased for a wide range of 208-600Vac projects.

To ensure the correct CTs are selected for the specific project application, the following guidelines are recommended:

- The current transducer/transformers may be purchased either from Continental Control Systems, LLC or from any other 3rd party CT vendor.
- The CTs must have a 0.333Vac output, not a mA output.
- If the utility requires specific metering accuracy to meet Revenue-grade Metering and Reporting, then that should be noted and the correct accuracy for the CTs chosen.
- The CT range should be large enough for the application.
- In some cases, CTs may be paralleled where the conductors are also paralleled.
- If CTs are paralleled, please provide the CT rating and number in parallel to CPS so that the CT scale factor on the CPS FlexOM portal can be configured.

Example CT models that can be used include:



**Continental Control Systems, LLC
ACTL Series**



**Veris Industries
H681x-V Series**

THIRD SUN SOLAR
762 W. UNION ST.
ATHENS, OH 45701
(740) 249-4533
www.thirdsunsolar.com

PROJECT:
REACH EDUCATIONAL SERVICE LLC
4019 W DUBLIN GRANVILLE RD
JAMES WOMEN CENTER
DUBLIN, OH 43017

JOB NUMBER:
21-0031

PROJECT DETAILS:
54.3 kW/stc, 50 kW AC

ENGINEERING APPROVAL:

SHEET TITLE:
ENERGY METER DATASHEET

SHEET NUMBER:
D5.0

SHEET SIZE:
ANSI B (17.00 X 11.00 INCHES)

REVISIONS			
Description	Date	Int	Rev
ORIGINAL	06/15/21	KB	0
REV.A	06/23/21	KB	1
REV.B	06/30/21	KB	2
REV. C	07/06/21	KB	3
REV.D	07/14/21	KB	4

DRAFT:
KATHRYN BIGLER

REVIEWED: