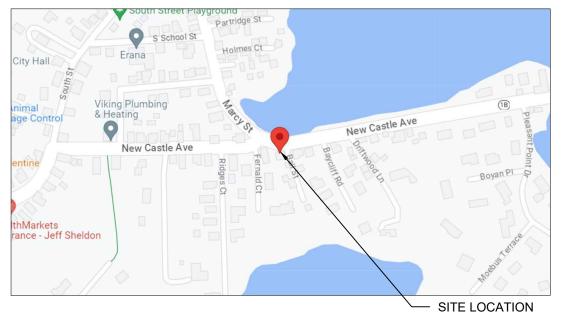
ROOF MOUNT PHOTOVOLTAIC SYSTEM

CODES:	CONSTRUCTION NOTES:
THIS PROJECT COMPLIES WITH THE FOLLOWING: 2020 NH STATE BUILDING CODE 2020 NH STATE FIRE CODE	CONDUIT AND CONDUCTOR SPECIFICATIONS ARE BASED ON MINIMUM CODE REQUIREMENTS AND ARE NOT MEANT TO LIMIT UP-SIZING AS REQUIRED BY FIELD CONDITIONS.
2018 INTERNATIONAL BUILDING CODE 2018 INTERNATIONAL RESIDENTIAL CODE 2018 INTERNATIONAL MECHANICAL CODE	ALL SOLAR ENERGY SYSTEM EQUIPMENT SHALL BE SCREENED TO THE MAXIMUM EXTENT POSSIBLE AND SHALL BE PAINTED A COLOR SIMILAR TO THE SURFACE UPON WHICH THEY ARE MOUNTED.
2018 INTERNATIONAL PLUMBING CODE 2018 INTERNATIONAL FUEL GAS CODE 2018 INTERNATIONAL ENERGY CONSERVATION CODE 2018 INTERNATIONAL EXISTING BUILDING CODE	MODULES SHALL BE TESTED , LISTED AND INDENTIFIED WITH FIRE CLASSIFICATION IN ACCORDANCE WITH UL 2703. SMOKE AND CARBON MONOXIDE ALARMS ARE REQUIRED PER SECTION R314 AND 315 TO BE VERIFIED AND INSPECTED BY INSPECTOR IN THE FIELD.
2018 INTERNATIONAL SWIMMING POOL AND SPA CODE "2018 NFPA 1, FIRE CODE AS AMENDED BY SAF-FMO 300"	DIG ALERT (811) TO BE CONTACTED AND COMPLIANCE WITH EXCAVATION SAFETY PRIOR TO ANY EXCAVATION TAKING PLACE
2018 NFPA 101 LIFE SAFETY CODE AS AMENDED BY SAF-FMO 300 2023 NATIONAL ELECTRICAL CODE AS ADOPTED BY CITY OF PORTSMOUTH (NH)	PHOTOVOLTAIC SYSTEM GROUND WILL BE TIED INTO EXISTING GROUND AT MAIN SERVICE FROM DC DISCONNECT/INVERTER AS PER 2023 NEC SEC 250.166(A).
	SOLAR PHOTOVOLTAIC SYSTEM EQUIPMENT WILL BE INSTALLED IN ACCORDANCE WITH REQUIREMENTS OF ART. 690 OF THE 2023 NEC

VICINITY MAP:



WIND SPEED: 121 SNOW LOAD: 50

TABLE OF CONTENTS:

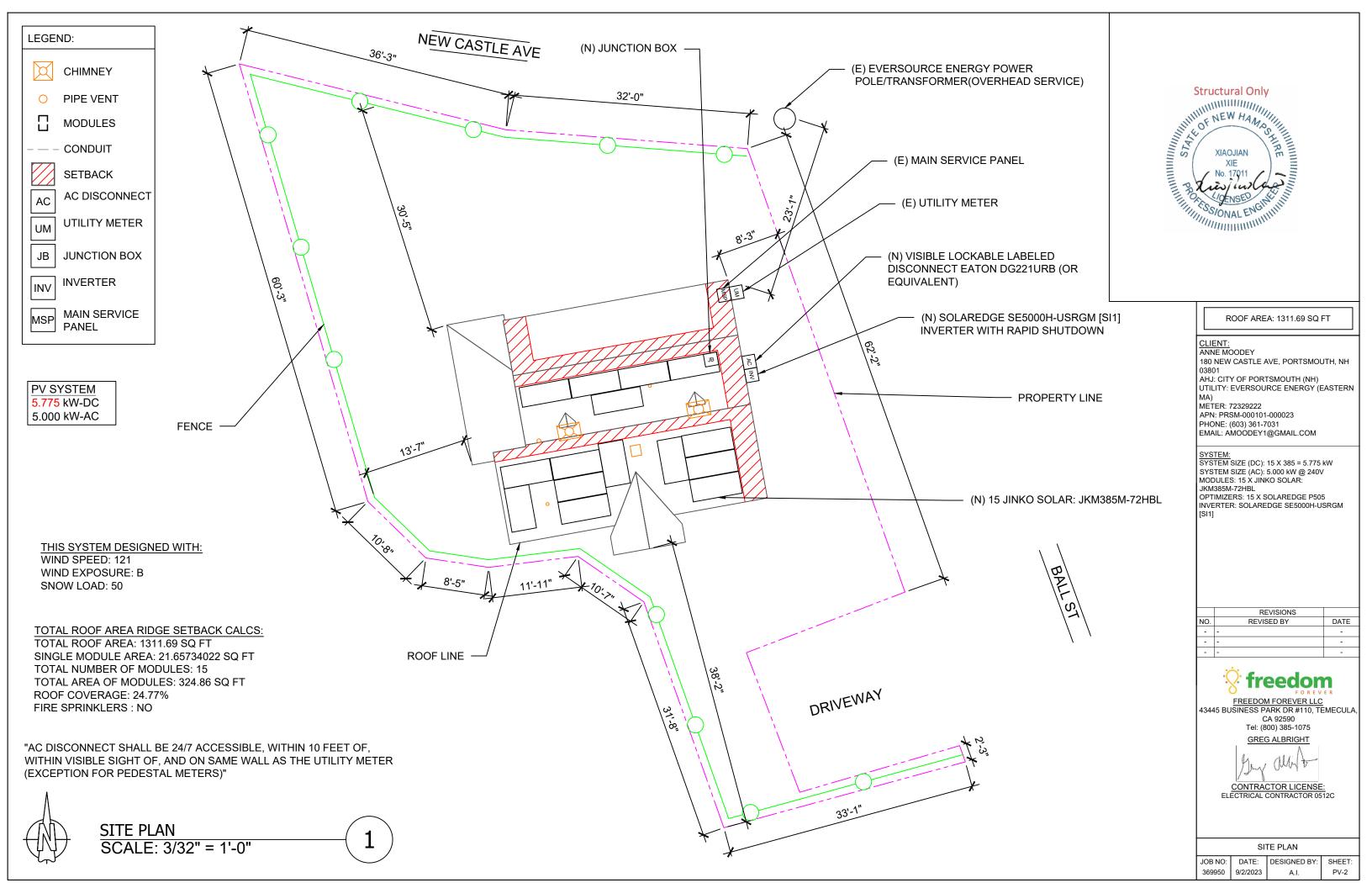
	ONTENTO.
PV-1	SITE LOCATION
PV-2	SITE PLAN
PV-2A	ROOF PLAN WITH MODULES LAYOUT
PV-2B	ROOF AND STRUCTURAL TABLES
PV-3	MOUNTING DETAILS
PV-4	THREE LINE DIAGRAM
PV-5	CONDUCTOR CALCULATIONS
PV-6	EQUIPMENT & SERVICE LIST
PV-7	LABELS
PV-7A	SITE PLACARD
PV-8	OPTIMIZER CHART
PV-9	SAFETY PLAN
PV-10	SAFETY PLAN
APPENDIX	MANUFACTURER SPECIFICATION SHEETS

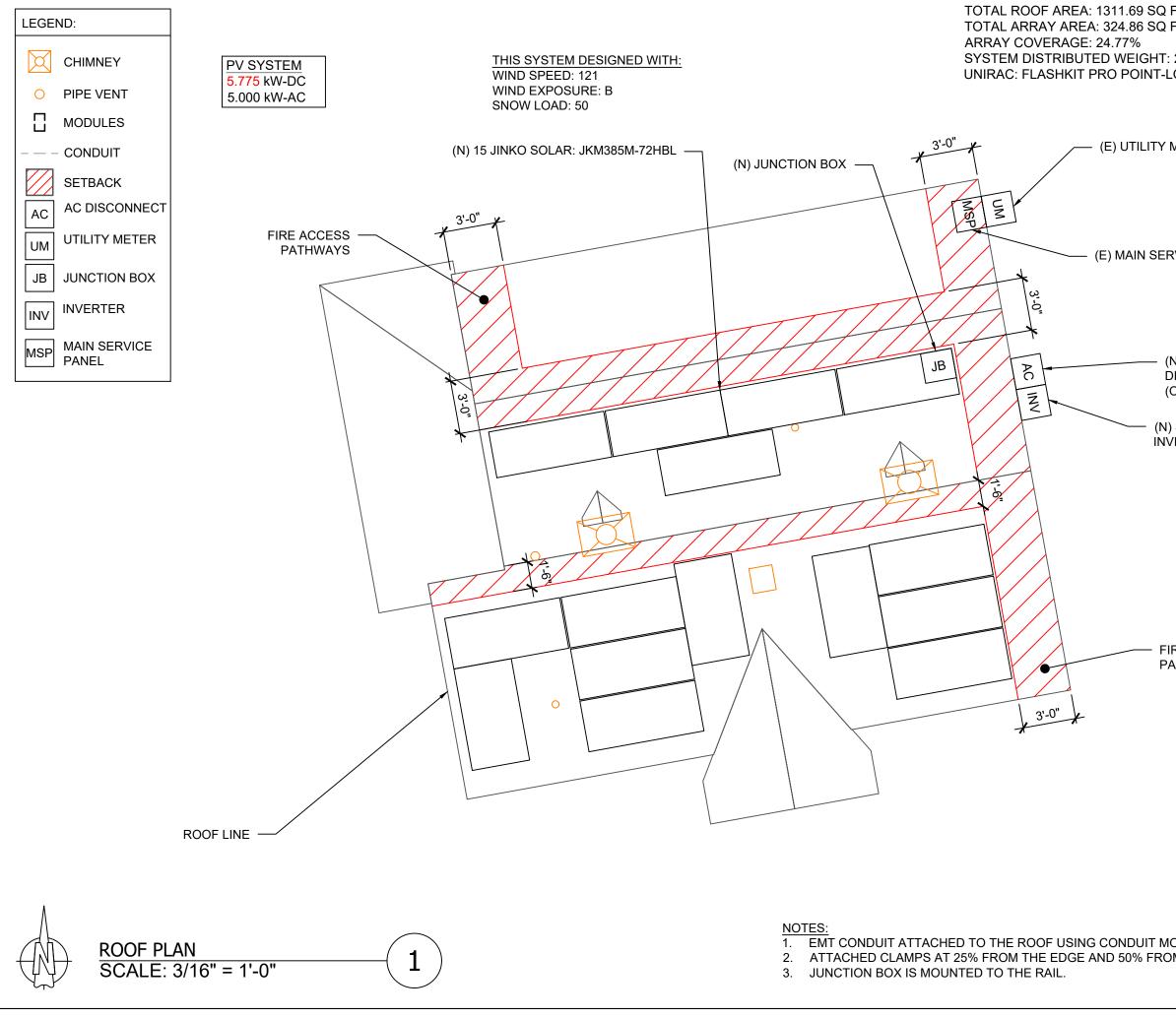
THE MAIN SERVICE PANEL WILL BE EQUIPPED WITH A GROUND ROD OR UFER UTILITY COMPANY WILL BE NOTIFIED PRIOR TO ACTIVATION OF THE SOLAR PV SYSTEM SOLAREDGE OPTIMIZERS ARE LISTED TO IEC 62109-1 (CLASS II SAFETY) AND UL 1741 STANDARDS

INSTALL CREW TO VERIFY ROOF STRUCTURE PRIOR TO COMMENCING WORK. EMT CONDUIT ATTACHED TO THE ROOF USING CONDUIT MOUNT.

THIS SYSTEM DESIGNED WITH: WIND EXPOSURE: B

ANN 180 0380 AHJ UTIL MA) MET APN PHC	CLIENT: ANNE MOODEY 180 NEW CASTLE AVE, PORTSMOUTH, NH 03801 AHJ: CITY OF PORTSMOUTH (NH) UTILITY: EVERSOURCE ENERGY (EASTERN MA) METER: 72329222 APN: PRSM-000101-000023 PHONE: (603) 361-7031 EMAIL: AMOODEY1@GMAIL.COM								
SYS SYS MOE JKM OPT	TEM DULE: 385M IMIZE RTE	SIZE (AC): S: 15 X JINH I-72HBL ERS: 15 X S	- 5.000 kW @ 240V (O SOLAR: OLAREDGE P50 DGE SE5000H-U	5					
		D							
NO.			EVISIONS SED BY	DATE					
NO.		REVIC		DATE					
	-			-					
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		SITE	LOCATION						
	NO:	DATE:	DESIGNED BY:	SHEET:					
369	950	9/2/2023	A.I.	PV-1					





FT FT		
: 2.29 LBS LOAD: 15.19 LBS	2	Structural Only
METER	STATE	Structural Only
RVICE PANEL		CONSED
(N) VISIBLE LOCKABI DISCONNECT EATON		ROOF AREA: 1311.69 SQ FT
(OR EQUIVALENT)	DOZZIOND	CLIENT: ANNE MOODEY 180 NEW CASTLE AVE, PORTSMOUTH, NH 03801
I) SOLAREDGE SE500 VERTER WITH RAPIE		AHJ: CITY OF PORTSMOUTH (NH) UTILITY: EVERSOURCE ENERGY (EASTERN MA)
		METER: 72329222 APN: PRSM-000101-000023 PHONE: (603) 361-7031 EMAIL: AMOODEY1@GMAIL.COM
		SYSTEM: SYSTEM SIZE (DC): 15 X 385 = 5.775 kW SYSTEM SIZE (AC): 5.000 kW @ 240V MODULES: 15 X JINKO SOLAR: JKM385M-72HBL OPTIMIZERS: 15 X SOLAREDGE P505 INVERTER: SOLAREDGE SE5000H-USRGM [SI1]
IRE ACCESS PATHWAYS		
		REVISIONS NO. REVISED BY DATE
		· · · · · ·
		43445 BUSINESS PARK DR #110, TEMECULA, CA 92590 Tel: (800) 385-1075 <u>GREG ALBRIGHT</u>
		CONTRACTOR LICENSE: ELECTRICAL CONTRACTOR 0512C
IOUNTS OM THE CENTER OF	THE MODULES	
		ROOF PLAN WITH MODULES LAYOUT JOB NO: DATE: DESIGNED BY: SHEET:

369950 9/2/2023

PV-2A

A.I.

ROOF DETAILS:

TOTAL ROOF AREA: 1311.69 SQ FT TOTAL ARRAY AREA: 324.86 SQFT ARRAY COVERAGE: 24.77% SYSTEM DISTRIBUTED WEIGHT: 2.29 LBS UNIRAC: FLASHKIT PRO POINT-LOAD: 15.19 LBS

			ROOF ARE	EA STATEMENT		
ROOF	MODULE QUANTITY	ROOF PITCH	ARRAY PITCH	AZIMUTH	ROOF AREA	ARRAY ARE
ROOF 1	10	28	28	170	462.46 SQ FT	216.57 SQ F
ROOF 2	5	37	37	170	345.37 SQ FT	108.29 SQ F
					SQ FT	SQ FT
					SQ FT	SQ FT
					SQ FT	SQ FT
					SQ FT	SQ FT
					SQ FT	SQ FT
					SQ FT	SQ FT
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•	· ·		•	•	•	•



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CLIENT: ANNE MOODEY 180 NEW CASTLE AVE, PORTSMOUTH, NH 03801 AHJ: CITY OF PORTSMOUTH (NH) UTILITY: EVERSOURCE ENERGY (EASTERN MA) METER: 72329222 APN: PRSM-000101-000023 PHONE: (603) 361-7031 EMAIL: AMOODEY1@GMAIL.COM

 SYSTEM:

 SYSTEM SIZE (DC): 15 X 385 = 5.775 kW

 SYSTEM SIZE (AC): 5.000 kW @ 240V

 MODULES: 15 X JINKO SOLAR:

 JKM385M-72HBL

 OPTIMIZERS: 15 X SOLAREDGE P505

 INVERTER: SOLAREDGE SE5000H-USRGM

 ISI1
 [SI1]

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FOREVER FREEDOM FOREVER LLC 43445 BUSINESS PARK DR #110, TEMECULA, CA 92590 Tel: (800) 385-1075

GREG ALBRIGHT

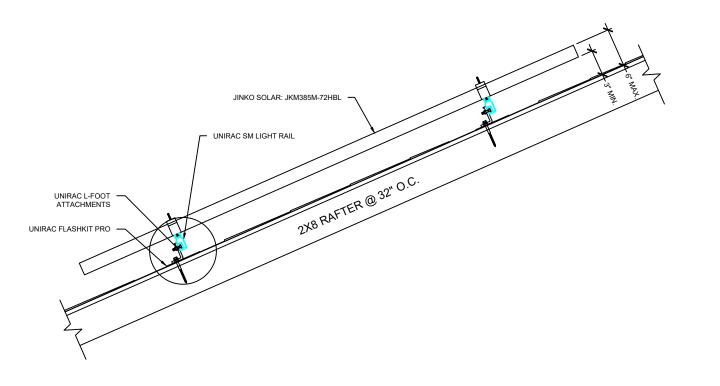
Bry CONTRACTOR LICENSE: ELECTRICAL CONTRACTOR 0512C

ROOF DETAILS

JOB NO:	DATE:	DESIGNED BY:	SHEET:
369950	9/2/2023	A.I.	PV-2B

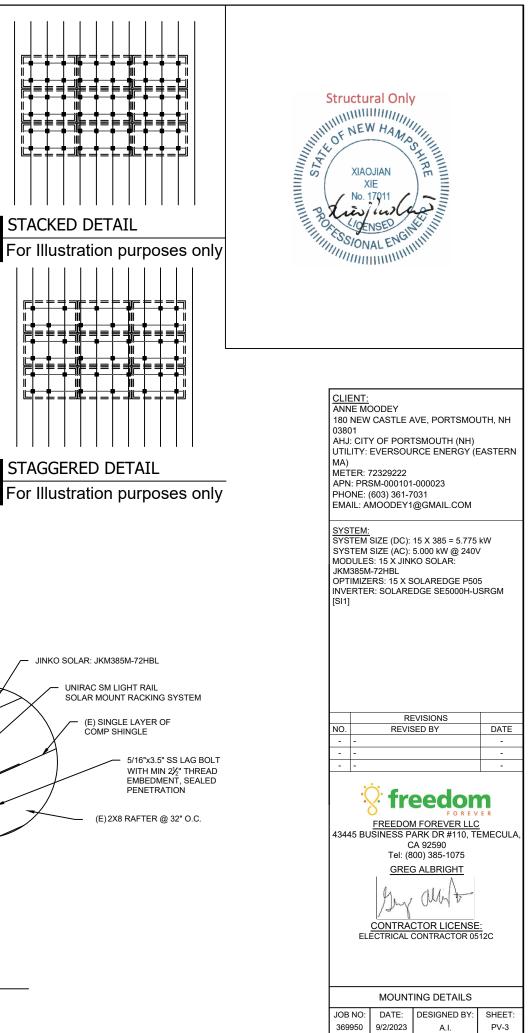
				TABLE 1 - ARRAY INS	TALLATION						∳_∳_ ≝≣≣	ੂ∎⊒	ⅈҍ₸
	ROOF PITCH	ROOFING TYPE	ATTACHMENT TYPE	FRAMING TYPE	MAX UNBRACED LENGTH(FT.)	STRUCTURAL ANALYSIS RESULT	PENETRATION PATTERN	MAX ATTACHMENT SPACING (IN.)	MAX RAIL OVERHANG(I N.)		╺ ╺ ╡═╴╪ ┥ ┥	╶╋╶╝ ╶╋╶╝ ╺╋╶╝ ╺╋╶╝ ╺╋╶╝ ╺╋╶╝	
00F 1	28	Comp Shingle	Unirac Flashkit Pro	2x8 RAFTER @ 32" O.C.	7.1	PASS	STAGGERED	32	10.66667		┫═╞╴	₹┚	F
00F 2	37	Comp Shingle	Unirac Flashkit Pro	2x8 RAFTER @ 32" O.C.	7.1	PASS	STAGGERED	32	10.66667				
										ST	' I ACK	ED	') D
										For			
										に 日 日 日			
L. CONTRA	CTOR TO VE	RIFY FRAMING TYPE AND MAX	L UNBRACED LENGTH PRIOR TO INSTA		I I I I I I I I I I I I I I I I I I I	CH FIELD CONDITIONS, NO	TIFY ENGINEER OF REC	ORD IMMEDIATELY.				╶╋╶╜	
		OR RAFTER SUPPORTS EXIST,	CONTRACTOR SHALL USE RAFTERS W	ITH COLLAR TIES AS ATTACHME	NT POINTS.							┋╡	

STAGGERED DETAIL



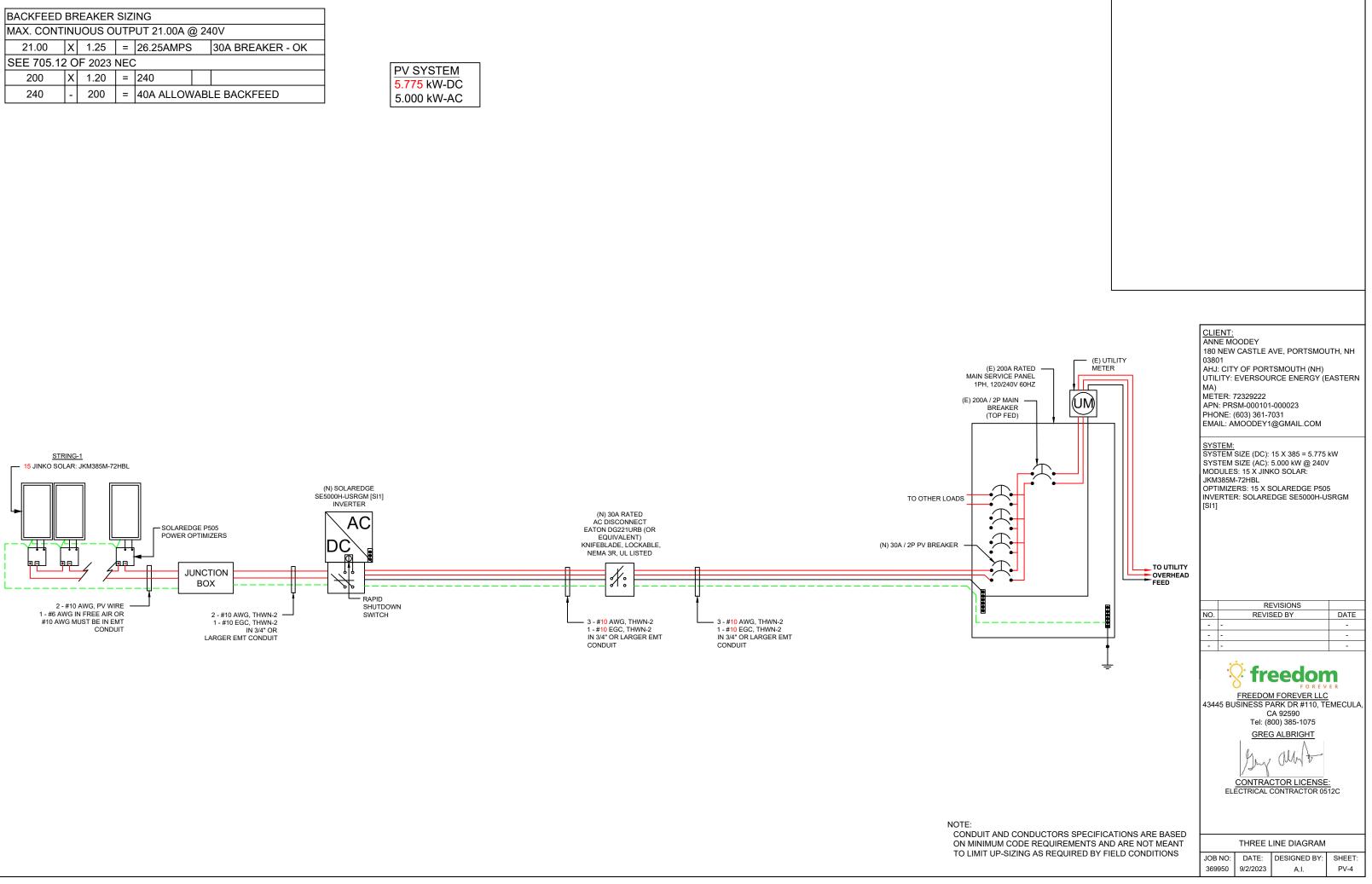
GROUNDING END/MID CLAMP UNIRAC CHANNEL NUT 3 UNIRAC L-FOOT ATTACHMENTS UNIRAC FLASHKIT PRO

SOLAR PV ARRAY SECTION VIEW ATTACHMENT DETAIL Scale: NTS Scale: NTS



L												
	BACKFEED BREAKER SIZING											
	MAX. CONTINUOUS OUTPUT 21.00A @ 240V											
	21.	00	Х	1.25	=	26.25AMPS		30A BREAKER - OK				
	SEE 7	705.12	2 C)F 2023	NEC	;						
	20	0	Х	1.20	=	240						
	24	0	-	200	=	40A ALLOW	/ABI	_E BACKFEED				
									-			





					WIRE	SCHEDU	JLE						CLIENT: ANNE MOODEY				
ACEWAY #	EQUIPMENT				EQUIPMENT CONDUCTOR AWG ALLOW QTY. QTY. AMPACIT				EQUIPMENT CONDUCTOR QTY. AWG ALLOWABLE AWPACITY @ 90°C APPLIED TO FACTOR CONDUCTORS 310 15 (P)/16) CONDUCTORS 310 15 (P)/20(a) CONDUCTOR				ADJUSTMENT FACTOR FOR MORE THAN 3 CONDUCTORS 310.15(B)(3)(a)	ADJUSTED CONDUCTOR AMPACITY @ 90°C	MAXIMUM CURRENT APPLIED TO CONDUCTORS IN RACEWAY	180 NEW CASTLE AVE, PORTSMO 03801 AHJ: CITY OF PORTSMOUTH (NH) UTILITY: EVERSOURCE ENERGY (MA) METER: 72329222 APN: PRSM-000101-000023	
1	DC	MODULE	ТО	OPTIMIZER	2	10	40	12.40	0.91	1	36.40	15.50	PHONE: (603) 361-7031 EMAIL: AMOODEY1@GMAIL.COM				
2	DC	OPTIMIZER	ТО	JUNCTION BOX	2	10	40	15.00	0.91	1	36.40	18.75					
3	DC	JUNCTION BOX	ТО	INVERTER	2	10	40	15.00	0.91	1	36.40	18.75	<u>SYSTEM:</u> SYSTEM SIZE (DC): 15 X 385 = 5.775				
4	AC	INVERTER	ТО	AC DISCONNECT	3	10	40	21.00	0.91	1	36.40	26.25	SYSTEM SIZE (AC): 5.000 kW @ 240 MODULES: 15 X JINKO SOLAR:				
5	AC	AC DISCONNECT	то	POI	3	10	40	21.00	0.91	1	36.40	26.25	JKM385M-72HBL OPTIMIZERS: 15 X SOLAREDGE P50				
													INVERTER: SOLAREDGE SE5000H- [SI1]				
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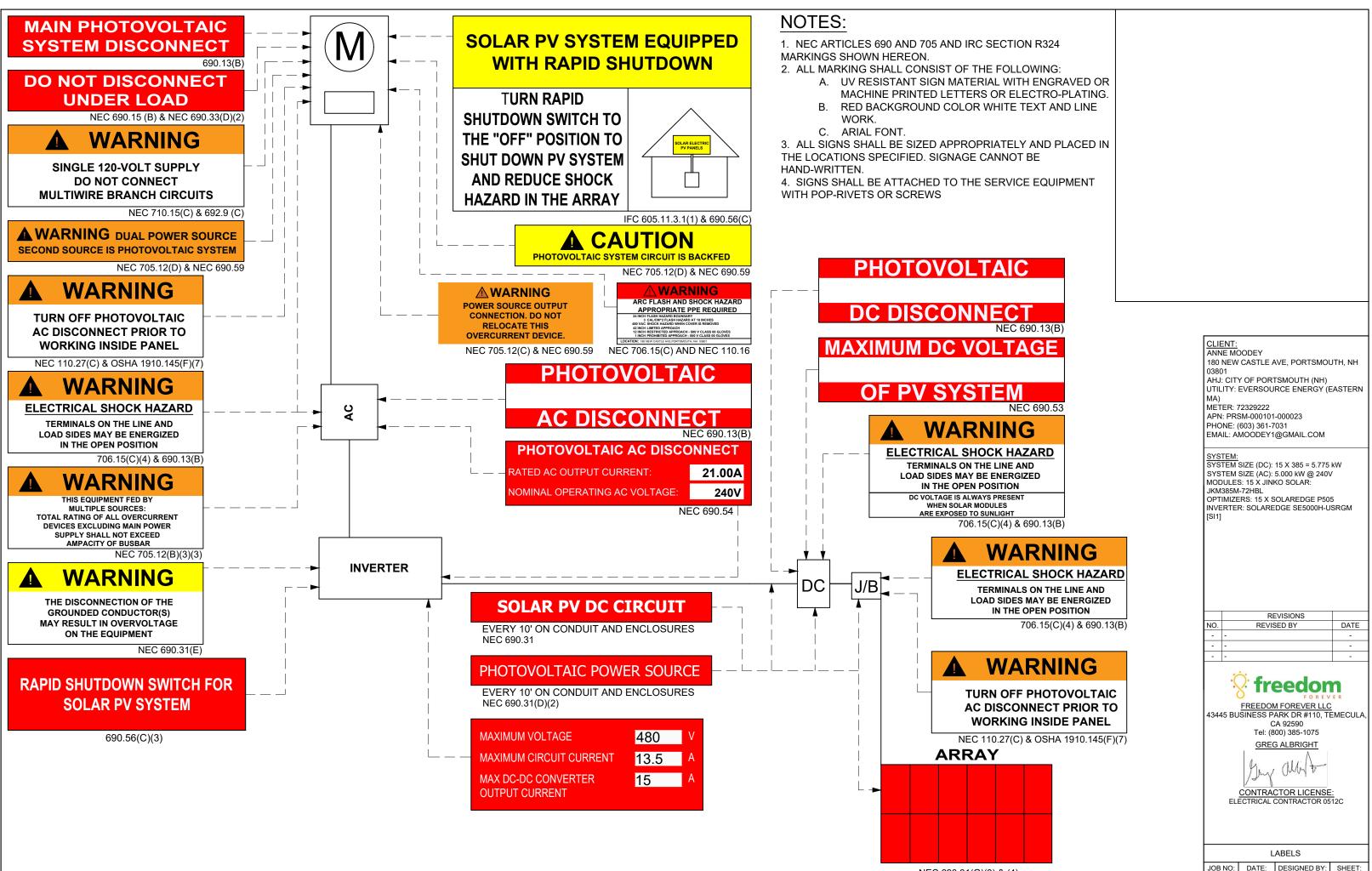
SERVICE LIST:

NONE		

MATERIAL LIST:

A - 1			
QTY.		PART #	DESCRIPTION
15	MODULES	PV-118-385	JINKO SOLAR: JKM385M-72HBL
15	OPTIMIZERS	OPT-130-505	SOLAREDGE P505 POWER OPTIMIZER - FRAME MOUNTED MODULE ADD-ON
1	JUNCTION BOX	RAC-261-527	600VDC NEMA 3R UL LISTED JUNCTION BOX
2	ELECTRICAL ACCESSORIES	EA-350-326	STAUBLI / MULTI-CONTACT MC4 CONNECTORS (FEMALE)
2	EQUIPMENT ACCESSORIES	EA-350-327	STAUBLI / MULTI-CONTACT MC4 CONNECTORS (MALE)
1	INVERTERS	INV-120-508	SE5000H-US [SI1] RGM 240V INVERTER UL1741 SA CERTIFIED INTEGRATED ARC FAULT PROTECTION AND RAPID SHUTDOWN
1	MONITORING EQUIPMENT	ME-180-502	SOLAREDGE CELL MODEM
1	DISCONNECTS	EE-321-030	30A RATED 240VAC NEMA 3R UL LISTED
49	FITTINGS/ANCHORS	RAC-241-250	UNIRAC: FLASHKIT PRO
13	RAILS	RAC-211-100	UNIRAC SM LIGHT RAIL 168 INCH (TOTAL 178 FEET NEEDED)
15	FITTINGS/ANCHORS	RAC-261-517	BND T-BOLT AND NUT SS
16	ENDS/MIDS	RAC-221-101	SM MIDCLAMP PRO DRK
16	ENDS/MIDS	RAC-221-209	SM ENDCLAMP PRO W/ END CLAMP
6	FITTINGS/ANCHORS	RAC-261-600	BND SPLICE BAR PRO SERIES MILL
16	FITTINGS/ANCHORS	RAC-261-510	MICRO MNT BND TBOLT SS
5	RAILS	RAC-211-209-NS	E-BOSS CONDUIT MOUNT COMP KIT
9	RAILS	RAC-211-200	E-BOSS RAIL TRAY
3	RAILS	RAC-211-206	E-BOSS BRIDGE TRAY
5	RAILS	RAC-211-207	E-BOSS BRIDGE CLIPS
26	FITTINGS/ANCHORS	RAC-260-300	BURNDY GROUND WEEB-LUG
26	FOOTINGS	RAC-241-100	UNIRAC L-FOOT SERRATED W/T-BOLT CLEAR (KIT)
L	I		

	CLIENT:			
	ANNE M			
		CASTLE	VE, PORTSMO	UTH, NH
	03801			
			ISMOUTH (NH)	
		EVERSOU	RCE ENERGY (EASTERN
	MA)			
	METER: 1	72329222		
	APN: PR	SM-000101	-000023	
	PHONE:	(603) 361-7	031	
			@GMAIL.COM	
	SYSTEM:			
	SYSTEM	SIZE (DC):	15 X 385 = 5.775	kW
			5.000 kW @ 240'	V
			KO SOLAR:	
	JKM385N			
			OLAREDGE P50	
	INVERTE	R: SOLARE	DGE SE5000H-L	JSRGM
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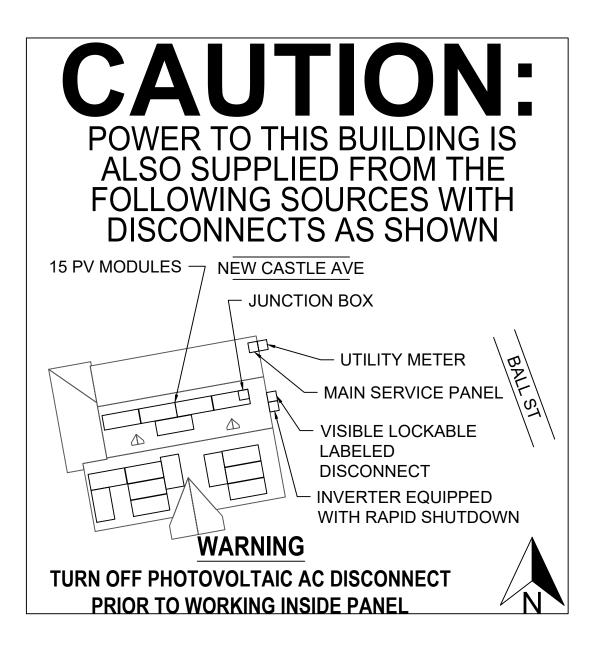
NEC 690.31(G)(3) & (4)

369950

9/2/2023

A.I.

PV-7



NOTES:

- 1. NEC ARTICLES 690 AND 705 AND IRC SECTION R324 MARKINGS SHOWN HEREON.
- 2. ALL MARKING SHALL CONSIST OF THE FOLLOWING:
 - A. UV RESISTANT SIGN MATERIAL WITH ENGRAVED OR MACHINE PRINTED LETTERS OR ELECTRO-PLATING.
 - B. RED BACKGROUND COLOR WHITE TEXT AND LINE WORK.
 - C. AERIAL FONT.
- 3. ALL SIGNS SHALL BE SIZED APPROPRIATELY AND PLACED IN THE LOCATIONS SPECIFIED. SIGNAGE CANNOT BE HAND-WRITTEN.
- 4. SIGNS SHALL BE ATTACHED TO THE SERVICE EQUIPMENT WITH POP-RIVETS OR SCREWS.

CLIENT:
ANNE MOODEY
180 NEW CASTLE AVE, PORTSMOUTH, NH
03801
AHJ: CITY OF PORTSMOUTH (NH)
UTILITY: EVERSOURCE ENERGY (EASTERN
MA)
METER: 72329222
APN: PRSM-000101-000023
PHONE: (603) 361-7031
EMAIL: AMOODEY1@GMAIL.COM

SYSTEM:
SYSTEM SIZE (DC): 15 X 385 = 5.775 kW
SYSTEM SIZE (AC): 5.000 kW @ 240V
MODULES: 15 X JINKO SOLAR:
JKM385M-72HBL
OPTIMIZERS: 15 X SOLAREDGE P505
INVERTER: SOLAREDGE SE5000H-USRGM
[SI1]

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43445 BUSINESS PARK DR #110, TEMECULA CA 92590 Tel: (800) 385-1075

GREG ALBRIGHT	
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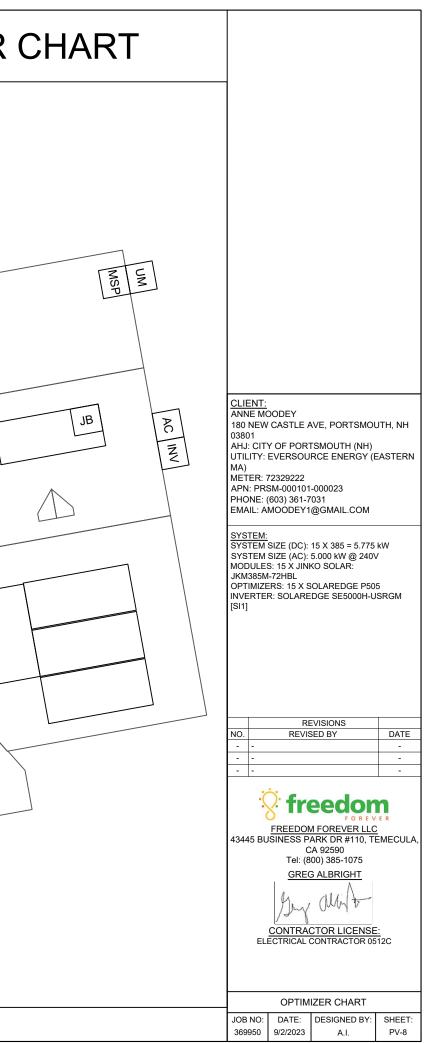
CONTRACTOR LICENSE:

ELECTRICAL CONTRACTOR 0512C

SITE PLACARD

JOB NO:	DATE:	DESIGNED BY:	SHEET:
369950	9/2/2023	A.I.	PV-7A

	1-10	11-20	21-30	31-40	41-50	51-60	SOLAREDGE OPTIMIZER
1							
2							
3							
4							
5							
6							
7							
8							
9							
10							



SAFETY PLAN

INSTRUCTIONS:

- 1. USE SYMBOLS IN KEY TO MARK UP THIS SHEET.
- 2. SAFETY PLAN MUST BE MARKED BEFORE JOB STARTS AS PART OF THE PRE-PLAN
- 3. DOCUMENT ALL ADDITIONAL HAZARDS ON THIS PAGE & MAKE NOTES ON THE JHA SHEET

INCIDENT REPORTING:

INJURIES - CALL INJURY HOTLINE

(855) 400-7233

*If injury is life threatening, call 911 first THEN the Injury Hotline

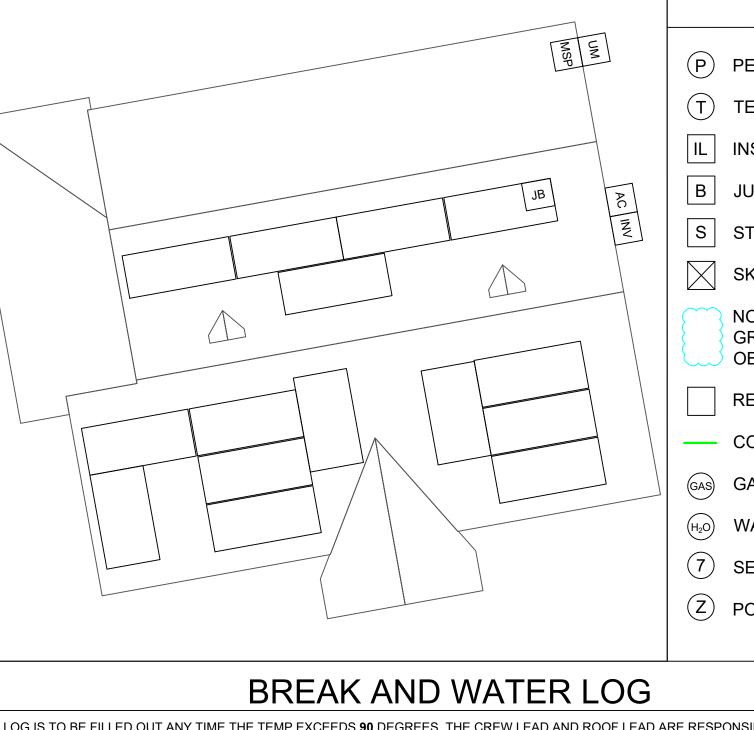
NON-INJURIES - USE MOBILE INCIDENT REPORTING (Auto, Property Damage, Near Miss)



NEAREST OCCUPATIONAL/INDUSTRIAL CLINIC:					
NAME:					
ADDRESS:					
NEAREST HOSPITAL:					
NAME:					
ADDRESS:					
SAFETY COACH CONTA	ACT INFORMATION:				
	ALL BE MADE AWARE OF THE SAFETY PLAN A ARE AWARE OF THE HAZARDS ON-SITE AND				
NAME	SIGNATURE	-			
		-			
		-			
		-			
<u> </u>					

TIME:

DATE:



THIS LOG IS TO BE FILLED OUT ANY TIME THE TEMP EXCEEDS **90** DEGREES. THE CREW LEAD AND ROOF LEAD ARE RESPO COMPLETED AND UPLOADED AT THE END OF EVERYDAY WHEN TEMPS EXCEED **90** DEGREES

	NAME	0800HRS	0900HRS	1000HRS	1100HRS	1200HRS	1300HRS	
_								

MARK UP KEY

F	PERMAN	ENT ANC	HOR				
-	TEMPOR	ARY ANG	CHOR				
I	NSTALLI	ER LADD	ER				
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F	RESTRIC	TED ACC	CESS	03801	CASTLE A	VE, PORTSMO	UTH, NH
(Г		UTILITY: MA) METER: 7	EVERSOU	RCE ENERGY (I	EASTERN
(GAS SHL	JT OFF		PHONE: (603) 361-7031 EMAIL: AMOODEY1@GMAIL.COM <u>SYSTEM:</u> SYSTEM SIZE (DC): 15 X 385 = 5.775 kW SYSTEM SIZE (AC): 5.000 kW @ 240V MODULES: 15 X JINKO SOLAR:			
١	WATER S	SHUT OF	F				
(SERVICE	DROP		JKM385M-72HBL OPTIMIZERS: 15 X SOLAREDGE P505 INVERTER: SOLAREDGE SE5000H-USRGM [SI1]			
F	POWER I	LINES					
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	1400HRS	1500HRS	1600HRS	43445 BIL	J FREEDON	FOREVER LLC	
					C Tel: (8	A 92590 00) 385-1075 ALBRIGHT	LWEGOLA,
					Bry	allinto	
						CTOR LICENSE	
					045	ETY PLAN	
				JOB NO: 369950	DATE: 9/2/2023	DESIGNED BY: A.I.	SHEET: PV-9

JOB HAZARD ANALYSIS

Crew leader to fill out all sections below, hold a pre-job safety meeting with all personnel, and upload this completed document and the Safety Plan to Site Capture

Ladder Access

- Ladders must be inspected before each use.
- Extension ladders must be set up on a firm and level surface at a 4-to-1 rise to run angle (or 75 degrees) and the top must be secured to the structure. Extension style ladders placed on uneven, loose or slippery surfaces must additionally have the base firmly anchored or lashed so the base will not slip out.
- Extension ladders must be used with walk-through devices or the ladder must extend 36" above the stepping off point.
- A-frame ladders must only be climbed with the ladder spreader bars locked in the open position; A-frame ladders shall not be climbed while in the closed position (ex, closed and used while leaned against a structure).
- Additional notes:

Mobile Equipment

- Only Qualified operators will operate equipment; operators must maintain a certification on their person for the equipment being operated.
- Type(s) of mobile equipment (Type/Make/Model):
- Qualified operator(s):

Material Handling and Storage

Materials will be staged/stored in a way that does not present a ٠ hazard to client, personnel or public. Materials stored on the roof will be physically protect from failing or sliding off.

Fall Protection

- A site-specific plan for fall prevention and protection is required prior to starting work and must remain onsite at all times until work is complete; a fall rescue plan must be outlined and discussed among the crew prior to work start.
- First-person-Up (FPU) must install their anchor and connect before any other task, including installing other anchors. The Last-Person-Down (LPD) must be the only person on a roof uninstalling fall protection.
- FPCP (name and title):
- FPU and LPD (name and title):

Electrical Safety

- The Electrical Qualified Person (EQP) is required onsite to ٠ perform electrical work.
- All electrical work will be performed with equipment in an electrically safe condition (de-energized) unless approval has been granted prior to work.
- Service drops and overhead electrical hazards will be indentified and protected from contact, as neccessary.
- EQP (name and tile):

Public Protection

- The safety of the Client and Public must be maintained at all times.
- The Client and the Public shall be prevented from entering the work zone through the use of barriers and/or signage, as required.
- Company, Client and Public property shall be protected from falling objects.
- Pets (including dogs) shall be secured by their owners prior to work start.
- The Client should not leave pets, family members, or others in charge or care of Employees, Contractors, or Temporary Workers.

- Crew leader responsible for communication with the client:
- Client and public is excluded from work area by barricades (N/A, Yes, No):

Training and Pre-Job Safety Briefing

- All employees onsite shall be made aware of the specific hazards of this project and review this HJA during a pre-job briefing, and their signature indicates awareness of site conditions and the plan to eliminate any hazards identified prior to and during the project.
- Crew leader (name/title):
- Crew member (name/title):

Airborne Contaminants:

- Asbestos-containing (Transite) piping (ACP) Do not disturb • (move, drill, cut fracture, etc.)
- Asbestos-containing thermal insulation (ACI) and • Asbestos-containing duct wrapping (ACW) - do not disturb, no attic or crawlspace access is allowed if work to be performed could cause exposure to personnel, client or public.
- If yes, list specific tasks and protection in place:

Weather and Environment

- The site supervisor shall forecast the weather conditions at the job site, prior to crew arrival, in order to mitigate any hazards associated with inclement weather (heat. cold. wind. rain. etc.)
- The site supervisor will utilized a portable wind meter (anemometer) to verify actual onsite wind conditions, by checking at the ground and on any elevated work surface (ex, rooftop) prior to work start, at midday and prior to solar panel staging on a roof.
- Elevated work involving the moving or maneuvering of solar panels shall cease at 25mph (sustained wind) until wind subsides
- Forecasted weather maximum temp (degrees f):

Heat Related Illness Prevention

- Employees shall have access to potable drinking water that is fresh, pure, and suitably cool. The water shall be located as close as practicable to the areas where employees are working. Water shall be supplied in sufficient quantity at the beginning of the work shift to provide at least one guart per employee per hour for drinking for the entire shift. Employees may begin the shift with smaller quantities of water if they identify the location and have effective means for replenishment during the shift to allow employees to drink on quart or more per hour. The frequent drinking of water shall be encouraged.
- Shade shall be present when temperature exceeds 80 degrees Fahrenheit. When the outdoor temperature in the work exceeds 80 degrees Fahrenheit, employees shall have and maintain one or more areas with shade at all times.
- New employees must be acclimatized. New employees will be monitored by their Crew Leader (site supervisor) for the first two (2) weeks of employment or longer when necessary.
- Employees will be allowed and encouraged to implement scheduled breaks during each shift. Employees must take cool-down breaks in the shade any time they feel the need to do so to protect them from overheating. Supervisors are REQUIRED to allow employees any break period they need during high heat conditions.
- Cool Vests are encouraged for all employees at all times during ٠ periods of high heat.
- Identify the location of the closet Occupational/Industrial Clinic ٠ or Hospital in case a crew member becomes ill.

What is the specific plan to provide and replenish sufficient water for all employees on site?

- If offsite replenish is necessary, where will you go to replenish water (location/address):
- Who will replenish the drinking water (name):

Restroom facilities

- Employees shall have access to restroom facilities with hand-washing stations. Use of onsite restroom is at the client's discretion (location is annotated below). If client does not give permission, location of suitable restroom facilities with hand-washing stations offsite will be provided. The onsite supervisor will identify location and make arrangements to ensure all employees have access at any point.
- Restroom facilities will be (circle one): Onsite Offsite
- If Offsite, add location name and address:

Incident Reporting Procedure

Contact your Site Supervisor

Name:

- Phone:
- Contact your Manager • Name:

Phone:

Contact your Site Supervisor

Name:

Phone:

With: Your full name, phone number, office location, brief description of what happen and when.

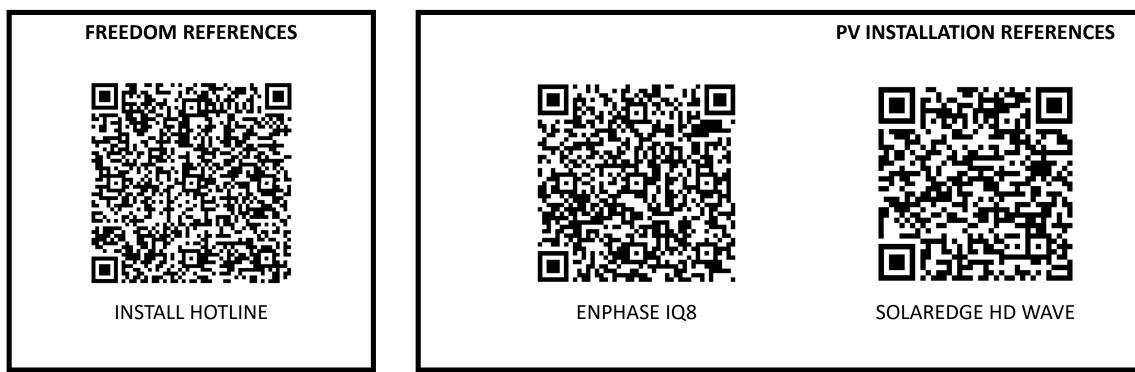
NOTE ADDITIONAL HAZARDS NOT ADDRESSED ABOVE

(add as many as necessary by using additional sheets)

Define the Hazard:	Method/steps to prevent incident:
Define the Hazard:	Method/steps to prevent incident:
Define the Hazard:	Method/steps to prevent incident:
Define the Hazard:	Method/steps to prevent incident:

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SYS SYS MOE JKM OPT	TEM OULE: 385M IMIZE	SIZE (AC): S: 15 X JINI I-72HBL ERS: 15 X S	15 X 385 = 5.775 5.000 kW @ 240\ {O SOLAR: :OLAREDGE P50: DGE SE5000H-U	5
		RF	EVISIONS	
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-	-			-
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4344		FREEDOM SINESS P. C Tel: (8 <u>GREC</u> <u>J</u> <u>CONTRAC</u> ECTRICAL (M FOREVER LLC ARK DR #110, TE AR 92590 00) 385-1075 B ALBRIGHT MM	EMECULA,
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FOR INSTALLATION REFERENCE ONLY SCAN QR CODE TO ACCESS REFERENCE LINK



BATTERY INSTALLATION REFERENCES











SOLAR BRANE

EAGLE 72HM G2 Black

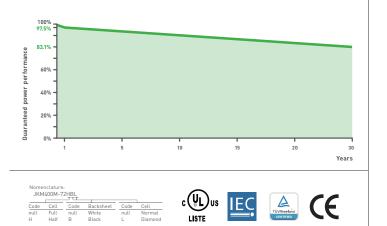
380-400 WATT • HALF CELL MONO PERC MODULE

Positive power tolerance of 0~+3%

- NYSE-listed since 2010, Bloomberg Tier 1 manufacturer
- Best-selling module globally for last 4 years
- Top performance in the strictest 3rd party labs
- 99.9% on-time delivery to the installer
- Automated manufacturing utilizing artificial intelligence
- Vertically integrated, tight controls on quality
- Premium solar panel factories in USA and Malaysia

LINEAR PERFORMANCE WARRANTY

25-Year Performance Warranty



- IS09001:2008 Quality Standards
- IS014001:2004 Environmental Standards
- IEC61215, IEC61730 certified products
- OHSAS18001 Occupational Health & Safety Standards UL1703 certified products

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KEY F	EATURES
	Diamond Hal



nd Half Cell Technology World-record breaking efficient mono PERC half cut



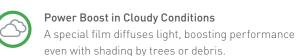
Designed for Long Life



Station, Mars Lander, and jetliners. 25-year warranty.

Shade Tolerant

Twin array design allows continued performance even with shading by trees or debris.



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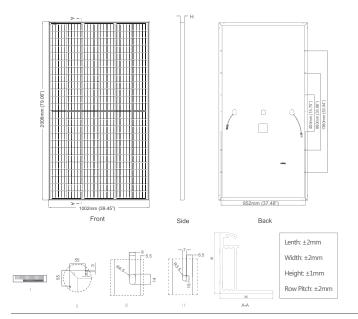


Protected Against All Environments

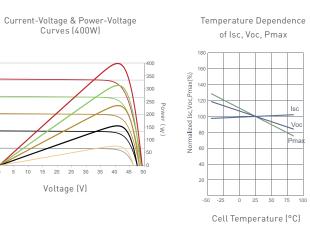
Certified to withstand humidity, heat, rain, marine environments, wind, hailstorms, and packed snow.



ENGINEERING DRAWINGS



ELECTRICAL PERFORMANCE & TEMPERATURE DEPENDENCE



ELECTRICAL CHARACTERISTICS

Module Type	JKM380M-72HBL	JKM385M-72HBL	JKM390M-72HBL	JKM395M-72HBL	JKM400M-72HBL
	STC NOCT				
Maximum Power (Pmax)	380Wp 286Wp	385Wp 290Wp	390Wp 294Wp	395Wp 298Wp	400Wp 302Wp
Maximum Power Voltage (Vmp)	40.5V 38.6V	40.8V 38.8V	41.1V 39.1V	41.4V 39.3V	41.7V 39.6V
Maximum Power Current (Imp)	9.39A 7.42A	9.44A 7.48A	9.49A 7.54A	9.55A 7.60A	9.60A 7.66A
Open-circuit Voltage (Voc)	48.9V 47.5V	49.1V 47.7V	49.3V 48.0V	49.5V 48.2V	49.8V 48.5V
Short-circuit Current (lsc)	9.75A 7.88A	9.92A 7.95A	10.12A 8.02A	10.23A 8.09A	10.36A 8.16A
Module Efficiency STC (%)	18.89%	19.14%	19.38%	19.63%	19.88%

*STC: - Irradiance 1000W/m² NOCT: - Irradiance 800W/m²

Cell Temperature 25°C Ambient Temperature 20°C

*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. JKM380-400M-72HBL-A3.1-US

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MECHANICAL CHARACTERISTICS

Cells	Mono PERC Diamond Cell (158.75x158.75mm)		
No. of Cells	144 (6x24)		
Dimensions	2008x1002x40mm (79.06x39.45x1.57in)		
Weight	22.5kg (49.6lbs)		
Front Glass	3.2mm, Anti-Reflection Coating High Transmission, Low Iron, Tempered Glass		
Frame	Anodized Aluminum Alloy		
Junction Box	IP67 Rated		
Output Cables	12AWG, 2286mm (90in) or Customized Length		
Fire Type	Туре 1		
Pressure Rating	5400Pa (Snow) & 2400Pa (Wind)		

TEMPERATURE CHARACTERISTICS

Temperature Coefficients of Pmax	-0.35%/°C
Temperature Coefficients of Voc	-0.29%/°C
Temperature Coefficients of Isc	0.048%/°C
Nominal Operating Cell Temperature (NOCT)	45±2°C

MAXIMUM RATINGS

Operating Temperature (°C) Maximum System Voltage Maximum Series Fuse Rating

-40°C~+85°C
1000VDC (UL/IEC)
20A

PACKAGING CONFIGURATION

(Two pallets = One stack)

27pcs/pallets, 54pcs/stack, 594pcs/40' HQ Container

△ AM = 1.5 △ AM = 1.5

—⊃ Wind Speed 1m/s



Power Optimizer

For North America

P320 / P340 / P370 / P400 / P401 / P405 / P485 / P505



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 modulelevel monitoring
- Meets NEC requirements for arc fault protection (AFCI) and Photovoltaic Rapid Shutdown System (PVRSS)
- / Module-level voltage shutdown for installer and firefighter safety



POWER

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PTIMIZ

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/ 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	350	370	400	40	05	485	505	W
Absolute Maximum Input Voltage (Voc at lowest temperature)	4	8	60	80	60	12	5(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	11.02	11	10.1	11.75	1	1	14	Adc
Maximum DC Input Current		13.75		12.5	14.65	12	.5	17.5	Adc
Maximum Efficiency				99.	5			1	%
Weighted Efficiency				98.8				98.6	%
Overvoltage Category									
OUTPUT DURING OPER/	ATION (POW	er optimiz	ER CONNECT	ED TO OPER	RATING SOL	AREDGE INV	ERTER)		
Maximum Output Current				15					Adc
Maximum Output Voltage		60 85							Vdc
OUTPUT DURING STAND	DBY (POWER	OPTIMIZER	DISCONNECTE	D FROM SO	LAREDGE IN	VERTER OR S	SOLAREDGE	INVERTER O	FF)
Safety Output Voltage per Power Optimizer		1 ± 0.1						Vdc	
STANDARD COMPLIANC	E								
EMC			FCC Pa	rt15 Class B, IEC61	1000-6-2, IEC6100	0-6-3			
Safety				IEC62109-1 (class	II safety), UL1741				
Material				UL94 V-0, U	V Resistant				
RoHS				Ye	S				
INSTALLATION SPECIFIC	ATIONS								
Maximum Allowed System Voltage				100	00				Vdc
Compatible inverters			All SolarEd	dge Single Phase	and Three Phase i	inverters			
Dimensions (W x L x H)	129 >	(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			MC	1 (3)			Single or dual MC4 ⁽³⁾⁽⁴⁾	MC4 ⁽³⁾	
Input Wire Length		0.16	/ 0.52		0.16 or 0.9 /0.52 or 2.95 ⁽⁵⁾		0.16 / 0.52		m / ft
Output Wire Type / Connector				Double Insul	ated / MC4				
Output Wire Length	0.9 /	2.95			1.2 /	3.9			m / ft
Operating Temperature Range ⁽⁶⁾				-40 to +85 /					°C / °F
Protection Rating				IP68 / Ty	•				
Relative Humidity				0 - 1					%
 Rated power of the module at STC will NEC 2017 requires max input voltage bits For other connector types please continue of the product version for parallel connection 	be not more than 80° tact SolarEdge n of two modules us	v e P485-4NMDMRM.	In the case of an odd n	umber of PV module			ersion power optim	izer connected to	

(5) Longer inputs wire length are available for use. For 0.9m input wire length order P401-xxxLxxx
(6) 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

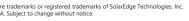
PV System Design Using SolarEdge Inverter ⁽⁷⁾⁽⁸⁾	ga	Single Phase HD-Wave	Single phase	Three Phase for 208V grid	Three Phase for 277/480V grid	
Minimum String Length	P320, P340, P370, P400, P401	8	3	10	18	
(Power Optimizers) P405, P485, P505		6	j	8	14	
Maximum String Length (Power Optimizers)		25		25	50 ⁽⁹⁾	
Maximum Power per String		5700 (6000 with SE7600-US - SE11400- US)	5250	6000(10)	12750(11)	W
Parallel Strings of Different Lengths or Orientations			Y	'es		

(7) For detailed string sizing information refer to: http://www.solaredge.com/sites/default/files/string_sizing_na.pdf

 (1) For 0 befalled Sumg starting information refer to: http://www.sourceg.com/act/sourceg.cou/act/sourceg.com/act/sourceg.cou/act (11) 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

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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, NEC 2017 and NEC 2020 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)



NVERTERS

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

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

IODEL NUMBER	SE3000H-US	SE3800H-US	SE5000H-US	SE6000H-US	SE7600H-US	SE10000H-US	SE11400H-US		
PPLICABLE TO INVERTERS		SEXXXXH-XXXXBXX4							
OUTPUT	·								
ated AC Power Output	3000	3800 @ 240V 3300 @ 208V	5000	6000 @ 240V 5000 @ 208V	7600	10000	11400 @ 240V 10000 @ 208V	VA	
1aximum AC Power Output	3000	3800 @ 240V 3300 @ 208V	5000	6000 @ 240V 5000 @ 208V	7600	10000	11400 @ 240V 10000 @ 208V	VA	
C Output Voltage MinNomMax. 211 - 240 - 264)	~	~	~	~	~	✓	~	Vac	
C Output Voltage MinNomMax. 83 - 208 - 229)	-	*	-	×	-	-	✓	Vac	
C Frequency (Nominal)				59.3 - 60 - 60.5(1)				Hz	
1aximum Continuous Output urrent @240V	12.5	16	21	25	32	42	47.5	A	
1aximum Continuous Output urrent @208V	-	16	-	24	-	-	48.5	A	
ower Factor		1	. 1	, Adjustable - 0.85 to	0.85				
FDI Threshold				1				Α	
tility Monitoring, Islanding Protection, ountry Configurable Thresholds				Yes					
NPUT	•								
1aximum DC Power @240V	4650	5900	7750	9300	11800	15500	17650	W	
1aximum DC Power @208V	-	5100	-	7750	-	-	15500	W	
ansformer-less, Ungrounded				Yes					
1aximum Input Voltage				480				Vdc	
Iominal DC Input Voltage		3	380			400		Vdc	
1aximum Input Current @240V ⁽²⁾	8.5	10.5	13.5	16.5	20	27	30.5	Adc	
1aximum Input Current @208V ⁽²⁾	-	9	-	13.5	-	-	27	Adc	
1ax. Input Short Circuit Current				45				Adc	
everse-Polarity Protection		Yes							
round-Fault Isolation Detection				600ko Sensitivity					
1aximum Inverter Efficiency	99			ç	9.2			%	
EC Weighted Efficiency				99			99 @ 240V 98.5 @ 208V	%	
lighttime Power Consumption				< 2.5				W	
EC Weighted Efficiency				99	9.2				

(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

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

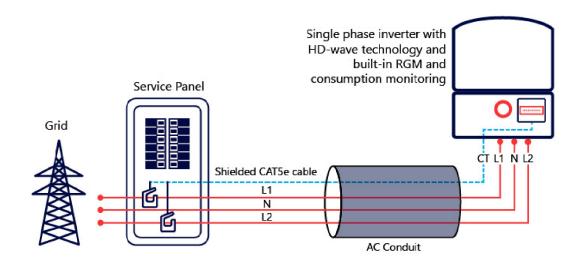
MODEL NUMBER	SE3000H-US SE3800H-US	3000H-US SE3800H-US SE5000H-US SE6000H-US SE7600H-US SE10000H-US SE11400H-US					
ADDITIONAL FEATURES							
Supported Communication Interfaces		RS485, Ethernet, Zic	Bee (optional), Cellular (opti	onal)			
Revenue Grade Metering, ANSI C12.20			Quetti e e e 1(2)				
Consumption metering			Optional ⁽³⁾				
Inverter Commissioning	With the Set	App mobile application us	sing Built-in Wi-Fi Access Poir	nt for Local Connection			
Rapid Shutdown - NEC 2014, NEC 2017 and NEC 2020, 690.12		Automatic Rapid Shutdown upon AC Grid Disconnect					
STANDARD COMPLIANCE							
Safety	UL1741,	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		FC	C Part 15 Class B				
INSTALLATION SPECIFICAT	IONS						
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'' Ma	1" Maximum / 1-2 strings / 14-6 AWG 1" Maximum / 1-3 strings / 14-6 AWG					
Dimensions with Safety Switch (HxWxD)	17.7	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					
Weight with Safety Switch	22 / 10	25.1 / 11.4	26.2 / 11.9	38.8 / 17.6	lb / kg		
Noise		< 25 <50					
Cooling		Na	tural Convection				
Operating Temperature Range		-40 to	+140 / -40 to +60 ⁽⁴⁾		°F/°C		
Protection Rating		NEMA 4X (Ir	nverter with Safety Switch)				

(3) Inverter with Revenue Grade Meter P/N: SExxxxH-US000BNC4; Inverter with Revenue Grade Production and Consumption Meter P/N: SExxxxH-US000BNI4 . 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



Eaton DG221URB

Catalog Number: DG221URB

Eaton General duty non-fusible safety switch, single-throw, 30 A, 240 V, NEMA 3R, Rainproof, Painted galvanized steel, Two-pole, Two-wire

General specifications Product Name Catalog Number DG221URB Eaton general duty non-fusible safety switch UPC 782113120232 Product Length/Depth Product Height 6.88 in 10.81 in Product Width Product Weight 6 lb 6.38 in Warranty Certifications Eaton Selling Policy 25-000, one (1) year UL Listed from the date of installation of the

Catalog Notes Product or eighteen (18) months from the WARNING! Switch is not approved for date of shipment of the Product, service entrance unless a neutral kit is whichever occurs first. installed.

Product specifications

Product Category General duty safety switch

Enclosure material Painted galvanized steel

Туре Non-fusible, single-throw

Fuse configuration Non-fusible

Number of wires

2

Enclosure NEMA 3R

Voltage rating 240V

Amperage Rating 30A

Number Of Poles

FAT•N

Powering Business Worldwide

Two-pole

Eaton Corporation plc Eaton House 30 Pembroke Road Dublin 4. Ireland Eaton.com © 2023 Eaton. All Rights property of their respective Reserved.



Resources

Catalogs Eaton's Volume 2—Commercial Distribution Multimedia Double Up on Safety Switching Devices Flex Center Specifications and datasheets

Eaton Specification Sheet - DG221URB

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FLASHKIT PRO



FLASHKIT PRO is the complete attachment solution for composition shingle roofs. Featuring Unirac's patented **SHED & SEAL** technology, a weather proof system which provides the ultimate protection against roof leaks. Kitted in 10 packs for maximum convenience, flashings and hardware are available in Mill or Dark finishes. With **FLASH**KIT pro, you have everything you need for a quick, professional installation.



FLASHKIT PRO

INSTALLATION GUIDE

FLASHKIT PRO IS THE COMPLETE FLASHING AND ATTACHMENT SOLUTION FOR COMPOSITION ROOFS.



STEP 2

INSTALL FLASHKIT PRO FLASHING

INSTALL L-FOOT

PRE-INSTALL

- · Locate roof rafters and snap chalk lines to mark the installation point for each roof attachment.
- Drill a 7/32" pilot hole at each roof attachment. Fill each pilot hole with sealant

STEP 1 INSTALL **FLASH**KIT PRO FLASHING

 Add a U-shaped bead of roof sealant to the underside of the flashing with the open side of the U pointing down the roof slope. Slide the aluminum flashing underneath the row of shingles directly up slope from the pilot hole as shown. Align the indicator marks on the lower end of the flashing with the chalk lines on the roof to center the raised hole in the flashing over the pilot hole in the roof. When installed correctly, the flashing will extend under the two courses of shingles above the pilot hole.

STEP 2 INSTALL L-FOOT

 Fasten L-foot and Flashing into place by passing the included lag bolt and pre-installed stainless steel-backed EPDM washer through the L-foot EPDM grommet, and the raised hole in the flashing, into the pilot hole in the roof rafter.

THE COMPLETE ROOF ATTACHMENT SOLUTION

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







ATTACH L-FOOT TO RAIL

• Drive the lag bolt down until the L-foot is held firmly in place. It is normal for the EPDM on the underside of the stainless steel backed EPDM washer to compress and expand beyond the outside edge of the steel washer when the proper torque is applied.

TIP:

- Use caution to avoid over-torqueing the lag bolt if using an impact driver.
- Repeat Steps 1 and 2 at each roof attachment point.

STEP 3 ATTACH L-FOOT TO RAIL

- Insert the included 3/8"-16 T-bolts into the lower slot on the Rail (sold separately), spacing the bolts to match the spacing between the roof attachments.
- · Position the Rail against the L-Foot and insert the threaded end of the T-Bolt through the continuous slot in the L-Foot. Apply anti-seize to bolt threads to prevent galling of the T-bolt and included 3/8" serrated flange nut. Place the 3/8" flange nut on the T-bolt and finger tighten. Repeat STEP 3 until all L-Feet are secured to the Rail with a T-bolt. Adjust the level and height of the Rail and torque each bolt to 30ft-lbs.



SOLARMOUNT

SOLARMOUNT is the professionals' choice for residential PV mounting applications. Every aspect of the system is designed for an easier, faster installation experience. **SOLAR**MOUNT is a complete solution with revolutionary universal clamps, FLASHKIT PRO, full system UL 2703 certification and 25-year warranty. Not only is **SOLAR**MOUNT easy to install, but best-in-class aesthetics make it the most attractive on any block!



THE PROFESSIONALS' CHOICE FOR RESIDENTIAL RACKING **BESTINSTALLATION EXPERIENCE • CURB APPEAL • COMPLETE SOLUTION • UNIRAC SUPPORT** FOR QUESTIONS OR CUSTOMER SERVICE VISIT UNIRAC.COM OR CALL (505) 248-2702

SOLARMOUNT

BETTER DESIGNS

TRUST THE INDUSTRY'S BEST DESIGN TOOL

Start the design process for every project in our U-Builder on-line design tool. It's a great way to save time and money.

BETTER SYSTEMS ONE SYSTEM - MANY APPLICATIONS

Quickly set modules flush to the roof on steep pitched roofs. Orient a large variety of modules in Portrait or Landscape. Tilt the system up on flat or low slow roofs. Components available in mill, clear, and dark finishes to optimize your design financials and aesthetics.

BETTER RESULTS MAXIMIZE PROFITABILITY ON EVERY JOB

Trust Unirac to help you minimize both system and labor costs from the time the job is quoted to the time your teams get off the roof. Faster installs. Less Waste. More Profits

BETTER SUPPORT

WORK WITH THE INDUSTRIES MOST EXPERIENCED TEAM

Professional support for professional installers and designers. You have access to our technical support and training groups. Whatever your support needs, we've got you covered. Visit Unirac.com/solarmount for more information.



UNIRAC CUSTOMER SERVICE MEANS THE HIGHEST LEVEL OF PRODUCT SUPPORT







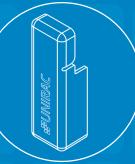
TECHNICAL SUPPORT

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 OUALITY PROVIDER Unirac is the only PV mounting vendor with ISO

ENHANCE YOUR REPUTATION WITH QUALITY RACKING SOLUTIONS BACKED BY ENGINEERING EXCELLENCE AND A SUPERIOR SUPPLY CHAIN PUB2018AUG31-PRINTED UPDATE FOR QUESTIONS OR CUSTOMER SERVICE VISIT UNIRAC.COM OR CALL (505) 248-2702

CONCEALED UNIVERSAL ENDCLAMPS



END CAPS INCLUDED WITH EVERY ENDCLAMP

UNIVERSAL SELF STANDING MIDCLAMPS



U-BUILDER ONLINE DESIGN TOOL SAVES TIME & MONEY

Visit design.unirac.com



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 providing products of exceptional quality. SOLARMOUNT is covered by a 25 year limited product warranty and a 5 year limited finish warranty.



Certificate of Compliance

Certificate: 70131735

Master Contract: 266909

2021-06-02

Project: 80082031 **Date Issued:**

Issued To: Unirac 1411 Broadway NE Albuquerque, New Mexico, 87102 **United States**

Attention: Klaus Nicolaedis

The products listed below are eligible to bear the CSA Mark shown with adjacent indicators 'C' and 'US' for Canada and US or with adjacent indicator 'US' for US only or without either indicator for Canada only.



Míchael Hoffnagle Issued by: Michael Hoffnagle

PRODUCTS

CLASS - C531302 - POWER SUPPLIES - PHOTOVOLTAICS-PV Racking and clamping systems CLASS - C531382 - POWER SUPPLIES - PHOTOVOLTAICS-PV Racking and clamping systems -Certified to US Standards

Models:	SM	-	SOLARMOUNT Flush-to-Roof is an extruded aluminum rail PV racking system that is installed parallel to the roof in landscape or portrait orientations.
	ULA	-	Unirac Large Array is a ground mount system using the SolarMount (SM) platform for the bonding and grounding of PV modules.

Solarmount

DOD 507 Rev. 2019-04-30

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Page 1



Certificate: 70131735 Project: 80082031

The system listed is designed to provide bonding/grounding, and mechanical stability for photovoltaic modules. The system is secured to the roof with the L-Foot components through the roofing material to building structure. Modules are secured to the racking system with stainless steel or aluminum mid clamps and Aluminum end clamps. The modules are bonded to the racking system with the stainless-steel bonding mid clamps with piercing points. The system is grounded with 10 AWG copper wire to bonding/grounding lugs. Fire ratings of Class A with Type 1, 2, 3, 10, 19, 22 or 25 for steep slope. Tested at 5" interstitial gap which allows installation at any stand-off height.

The grounding of the system is intended to comply with the latest edition of the National Electrical Code, to include NEC 250 & 690. Local codes compliance is required, in addition to national codes. All grounding/bonding connections are to be torqued in accordance with the Installation Manual and the settings used during the certification testing for the current edition of the project report.

The system may employ optimizers/micro-inverters and used for grounding when installed per installation instructions.

UL 2703 Mechanical Load ratings:

Downward Design Load (lb/ft ²)	113.5
Upward Design Load (lb/ft ²)	50.7
Down-Slope Load (lb/ft ²)	16.13

Test Loads:

Downward Load (lb/ft ²)	170.20
Upward Load (lb/ft ²)	76.07
Down-Slope Load (lb/ft ²)	24.2

Unirac Large Array

ULA is a ground mount system using the SolarMount (SM) platform for the bonding and grounding of PV modules. ULA aluminum components merge with SM rails and installer-supplied steel pipe. The SM rail system is secured to the horizontal Pipe using the Rail Bracket components. The Rear and Front cap secures the horizontal Pipe to the vertical Pipe. The Front cap is also used to secure the Cross brace. A Slider is attached to the vertical Pipe to secure the Cross brace. The SM rails, caps, slider, rail brackets, and cross braces materials are 6105-T5 aluminum extrusion. Fasteners materials are 304 stainless steel. Horizontal and vertical pipe materials meet the minimum requirements of ASTM A53 for galvanized steel pipe in 2" and 3" diameter.

The mechanical load ratings from the SM test data will be applied to the ULA model.

Fire Testing is not applicable due to being a ground mount system.

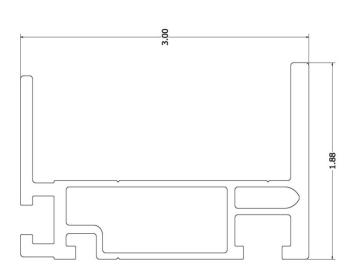
DOD 507 Rev. 2019-04-30

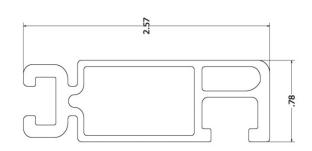


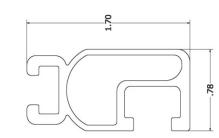
Master Contract: 266909 Date Issued: 2021-06-02











Properties	SOLARMOUNT Light	SOLARMOUNT Rail Profile 2	SOLARMOUNT HD	Units
BEAM HEIGHT	1.70	2.57	3.00	L
APPROX WEIGHT	0.491	0.728	1.271	plf
CROSS SECTION AREA	0.409	0.625	1.059	in ²
SECTION MODULUS (X-AXIS)	0.15	0.363	0.898	in ³
SECTION MODULUS (Y-AXIS)	0.067	0.113	0.221	in³
MOMENT OF INERTIA (X-AXIS)	0.13	0.467	1.45	in ⁴
MOMENT OF INERTIA (Y-AXIS)	0.026	0.045	0.267	in4
RADIUS OF GYRATION (X-AXIS)	0.564	0.865	1.17	L
RADIUS OF GYRATION (Y-AXIS)	0.254	0.269	0.502	i
				PAGE H

Certificate no.	110 001 (0	015 0
	US 82160	015 0
License Holder: Unirac Inc. 1411 Broadway N: Albuquerque NM USA		
Test report no.: USA- 31 Tested to: UL 2		
Certified Product: Moo Model Designatio Max System Vol	on: SolarMou tage of PV Mo	nt (S dule:
Max Size of PV Max Overcurren 30 A when us	Module: 20.8	sq.f Ratin fied
Fire Rating: C Type 1, Type	lass A when i 2, Type3, or	
Appendix: 1,1-5		
Licensed Test mark:		
\bigcirc		



Manufacturing Plant: Unirac Inc. 1411 Broadway NE Albuquerque NM 87102 USA

Client Reference: Tom Young

stem

License Fee - Units

7

00 VDC surface area f PV Module: unding lugs; inverter EGC.

with fire rated modules.

(continued)

Date of Issue (day/mo/yr) 27/07/2016

TÜV Rheinland PTL, LLC, 1107 W. Fairmont Drive, Building A, Tempe, Arizona 85282, Tel (480) 966-1700, Fax (775) 314-6458



March 31, 2020

Unirac 1411 Broadway Blvd. NE Albuquerque, NM 87102

Attn.: Unirac - Engineering Department

Re: Engineering Certification for the Unirac U-Builder 2.0 SOLARMOUNT Flush Rail

PZSE, Inc. - Structural Engineers has reviewed the Unirac SOLARMOUNT rails, proprietary mounting system constructed from modular parts which is intended for rooftop installation of solar photovoltaic (PV) panels; and has reviewed the Ubuilder Online tool. This U-Builder software includes analysis for the SOLARMOUNT LIGHT rail, SOLARMOUNT STANDARD rail, and SOLARMOUNT HEAVY DUTY rail with Standard and Pro Series hardware. All information, data and analysis contained within are based on, and comply with the following codes and typical specifications:

- 1. Minimum Design Loads for Buildings and other Structures, ASCE/SEI 7-05 and ASCE/SEI 7-10
- 2. 2006-2015 International Building Code, by International Code Council, Inc.
- 3. 2006-2015 International Residential Code, by International Code Council, Inc.
- 4. AC428, Acceptance Criteria for Modular Framing Systems Used to Support Photovoltaic (PV) Panels, November 1, 2012 by ICC-ES.
- 5. 2015 Aluminum Design Manual, by The Aluminum Association, 2015

Following are typical specifications to meet the above code requirements:

Design Criteria:	Ground Snow Load = 0 - 100 (psf) Basic Wind Speed = 85 - 190 (mph) Roof Mean Height = 0 - 60 (ft) Roof Pitch = 0 - 45 (degrees) Exposure Category = B, C & D
Attachment Spacing:	Per U-builder Engineering report.
Cantilever:	Maximum cantilever length is L/3, where "L" is the span noted in the U-Builder online tool.
Clearance:	2" to 10" clear from top of roof to top of PV panel.
Tolerance(s):	1.0" tolerance for any specified dimension in this report is allowed for installation.
Installation Orientation:	See SOLARMOUNT Rail Flush Installation Guide. Landscape - PV Panel long dimension is parallel to ridge/eave line of roof and the PV panel is mounted on the long side. Portrait - PV Panel short dimension is parallel to ridge/eave line of roof and the PV panel is mounted on the short side.

Components and Cladding Roof Zones:

The Components and Cladding Roof Zones shall be determined based on ASCE 7-05 and ASCE 7-10 Component and Cladding design.

Notes:

- include roof capacity check.
 - 2) Risk Category II per ASCE 7-10.
 - 3) Topographic factor, kzt is 1.0.
 - 4) Average parapet height is 0.0 ft.
 - 5) Wind speeds are LRFD values.
 - 6) Attachment spacing(s) apply to a seismic design category E or less.

Design Responsibility:

The U-Builder design software is intended to be used under the responsible charge of a registered design professional where required by the authority having jurisdiction. In all cases, this U-builder software should be used under the direction of a design professional with sufficient structural engineering knowledge and experience to be able to:

- Evaluate whether the U-Builder Software is applicable to the project, and .

This letter certifies that the Unirac SM SOLARMOUNT Rails Flush, when installed according to the U-Builder engineering report and the manufacture specifications, is in compliance with the above codes and loading criteria.

This certification excludes evaluation of the following components:

- of snow accumulation on the structure.
- 2) The attachment of the SM SOLARMOUNT Rails to the existing structure.
- 3) The capacity of the solar module frame to resist the loads.

This requires additional knowledge of the building and is outside the scope of the certification of this racking system.

If you have any questions on the above, do not hesitate to call.

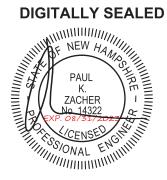
Prepared by: PZSE, Inc. – Structural Engineers Roseville, CA



1) U-builder Online tool analysis is only for Unirac SM SOLARMOUNT Rail Flush systems only and do not

Understand and determine the appropriate values for all input parameters of the U-Builder software.

1) The structure to support the loads imposed on the building by the array; including, but not limited to: strength and deflection of structural framing members, fastening and/or strength of roofing materials, and/or the effects



1478 Stone Point Drive, Suite 190, Roseville, CA 95661 T 916.961.3960 F 916.961.3965 W www.pzse.com Experience | Integrity | Empowerment