

PHOTOVOLTAIC GROUND MOUNT SYSTEM

36 MODULES - GROUND MOUNTED - 15.300 kW DC, 13.824 kW AC
32865 382ND PL, AITKIN, MN 56431



WOLF RIVER ELECTRIC
101 ISANTI PARKWAY NE, SUITE G
ISANTI, MN 55040
ELECTRICAL LICENCE# EA777669
BUILDING LICENCE# BC773271
CONTACT: (763) 229-6662
contact@wolfriverelectric.com

PHOTOVOLTAIC SYSTEM SPECIFICATIONS:

SYSTEM SIZE: 15.300 kW DC
13.824 kW AC
MODULE TYPE & AMOUNT: (36) SUNPOWER SPR-M425-H-AC (425W)
MODULE DIMENSIONS: (L/W/H) 73.7"/40.6"/1.32"
INVERTER: (36) ENPHASE IQ7HS-66-M-US (SPWR-A5)
INTERCONNECTION METHOD: SUPPLY TAP

GENERAL STRUCTURAL NOTES:

- a. THE SOLAR PANELS ARE TO BE MOUNTED TO THE GROUND USING THE SUNMODO SYSTEM.
- b. DESIGN CRITERIA:
 1. GROUND SNOW LOAD = 60 psf
 2. WIND SPEED = 101 mph
 3. EXPOSURE CATEGORY = C
 4. RISK CATEGORY = I

AUTHORITIES HAVING JURISDICTION:

BUILDING: AITKIN COUNTY
ZONING: AITKIN COUNTY
UTILITY: MILLE LACS ELECTRIC COOPERATIVE
UTILITY ACCOUNT NUMBER: N/A
UTILITY METER NUMBER: 152 486 167

SHEET INDEX:

PV 0.0: COVER SHEET
PV 0.1: PLOT PLAN
PV 1.0: SITE PLAN
PV 1.1: STRING LAYOUT
PV 1.2: EQUIPMENT ELEVATION
S 1.0: MOUNT DETAILS
S 1.1: MOUNT DETAILS
E 1.1: 3-LINE DIAGRAM
E 1.2: WIRE CALCULATION
E 1.3: WARNING LABELS
E 1.4: PLACARD
D 1.1+: EQUIPMENT SPEC SHEET

GOVERNING CODES

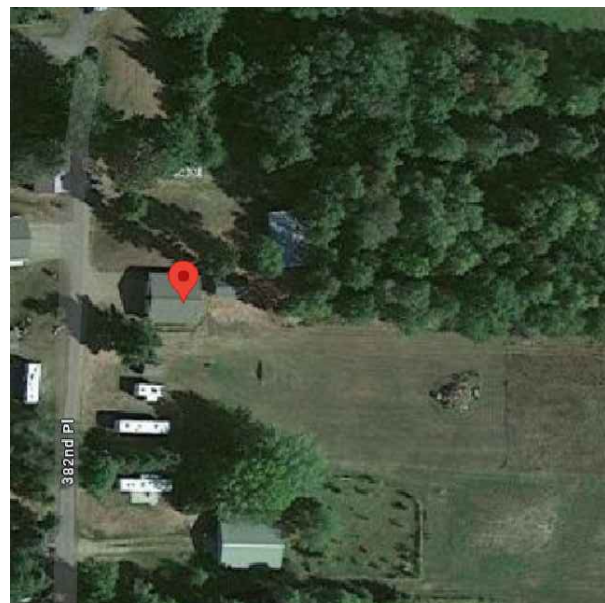
ALL WORK SHALL CONFORM TO THE FOLLOWING CODES

- a. 2023 NATIONAL ELECTRICAL CODE
- b. 2020 MINNESOTA RESIDENTIAL CODE
- c. 2020 MINNESOTA BUILDING CODE
- d. 2020 MINNESOTA RESIDENTIAL ENERGY CODE
- e. 2020 MINNESOTA ACCESSIBILITY CODE
- f. 2020 MINNESOTA MECHANICAL AND FUEL GAS CODE
- g. 2020 MINNESOTA PLUMBING CODE
- h. 2020 MINNESOTA STATE FIRE CODE
- i. ANY OTHER LOCAL AMENDMENTS

GENERAL ELECTRIC NOTES:

1. ALL COMPONENTS ARE UL LISTED AND CEC CERTIFIED, WHERE WARRANTED.
2. THE SOLAR PV SYSTEM WILL BE INSTALLED IN ACCORDANCE WITH ARTICLE 690 OF THE NEC 2023.
3. THE UTILITY INTERCONNECTION APPLICATION MUST BE APPROVED AND PV SYSTEM INSPECTED PRIOR TO PARALLEL OPERATION.
4. ALL CONDUCTORS OF A CIRCUIT, INCLUDING THE EGC, MUST BE INSTALLED IN THE SAME RACEWAY, OR CABLE, OR OTHERWISE RUN WITH THE PV ARRAY CIRCUIT CONDUCTORS WHEN THEY LEAVE THE VICINITY OF THE PV ARRAY.
5. WHERE METALLIC CONDUIT CONTAINING DC CONDUCTORS IS USED INSIDE THE BUILDING, IT SHALL BE IDENTIFIED AS "CAUTION: SOLAR CIRCUIT" EVERY 10FT.
6. HEIGHT OF THE AC DISCONNECT SHALL NOT EXCEED 6'-7" PER NEC CODE 240.24.
7. A GROUNDING ELECTRODE SYSTEM IN ACCORDANCE WITH CEC 690.47 AND 250.50 THROUGH 60 AND 250-166 SHALL BE PROVIDED. PER NEC GROUNDING ELECTRODE SYSTEM OF EXISTING BUILDING MAY BE USED AND BONDED TO THE SERVICE ENTRANCE. IF EXISTING SYSTEM IS INACCESSIBLE OR INADEQUATE A SUPPLEMENTAL GROUNDING ELECTRODE WILL BE USED AT THE INVERTER LOCATION CONSISTING OF A UL LISTED 8 FT. GROUND ROD WITH ACORN CLAMP. GROUNDING ELECTRODE CONDUCTORS SHALL BE NO LESS THAN #8 AWG AND NO LARGER THAN #6 AWG COPPER AND BONDED TO THE EXISTING GROUNDING ELECTRODE TO PROVIDE FOR A COMPLETE SYSTEM.
8. PHOTOVOLTAIC MODULES ARE TO BE CONSIDERED NON-COMBUSTIBLE.
9. ALL WIRING MUST BE PROPERLY SUPPORTED BY DEVICES OR MECHANICAL MEANS DESIGNED AND LISTED FOR SUCH USE. WIRING MUST BE PERMANENTLY AND COMPLETELY HELD OFF THE ROOF SURFACE.
10. ALL SIGNAGE TO BE PLACED IN ACCORDANCE WITH THE LOCAL BUILDING CODE. IF EXPOSED TO SUNLIGHT, IT SHALL BE UV RESISTANT. ALL PLAQUES AND SIGNAGE WILL BE INSTALLED AS REQUIRED BY THE NEC AND AHJ.
11. AS SPECIFIED BY THE AHJ, EQUIPMENT USED IN UNGROUNDED SYSTEMS LABELED ACCORDING TO NEC 690.35(F).
12. INVERTER(S) USED IN UNGROUNDED SYSTEM SHALL BE LISTED FOR THIS USE [NEC 690.35(G)].
13. THE INSTALLATION OF EQUIPMENT AND ALL ASSOCIATED WIRING AND INTERCONNECTION SHALL BE PERFORMED ONLY BY QUALIFIED PERSONS [NEC 690.4(C)].
14. ALL OUTDOOR EQUIPMENT SHALL BE NEMA 3R RATED (OR BETTER), INCLUDING ALL ROOF MOUNTED TRANSITION BOXES AND SWITCHES.
15. ALL EQUIPMENT SHALL BE PROPERLY GROUNDED AND BONDED IN ACCORDANCE WITH NEC ARTICLE 250.
16. SYSTEM GROUNDING SHALL BE IN ACCORDANCE WITH NEC 690.41.
17. PV SYSTEM CIRCUITS INSTALLED ON OR IN BUILDINGS SHALL INCLUDE A RAPID SHUTDOWN FUNCTION IN ACCORDANCE WITH NEC 690.12
18. DISCONNECTING MEANS SHALL BE LOCATED IN A VISIBLE, READILY ACCESSIBLE LOCATION WITHIN THE PV SYSTEM EQUIPMENT OR A MAXIMUM OF 10 FEET AWAY FROM THE SYSTEM [NEC 690.13(A)]
19. ALL WIRING METHODS SHALL BE IN ACCORDANCE WITH NEC 690.31
20. WORK CLEARANCES AROUND ELECTRICAL EQUIPMENT WILL BE MAINTAINED PER NEC 110.26(A)(1), 110.26(A)(2) AND 110.26(A)(3).
21. ELECTRICAL CONTRACTOR TO PROVIDE CONDUIT EXPANSION JOINTS AND ANCHOR CONDUIT RUNS AS REQUIRED PER NEC.

46.488717, -93.646706

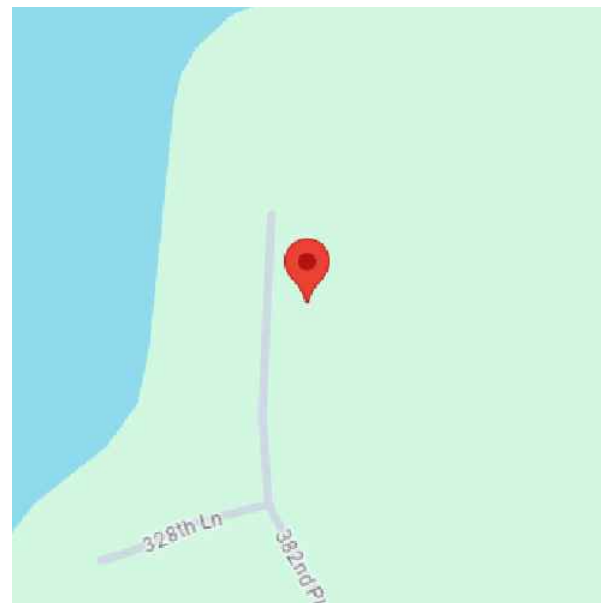


1 SATELLITE VIEW

PV 0.0

SCALE: NTS

46.488717, -93.646706



2 VICINITY MAP

PV 0.0

SCALE: NTS

REVISIONS

Description	Date	Rev
CAD 1	03-May-2024	00
CAD 2	06-May-2024	01
CAD 3	09-May-2024	02

Signature with Seal

Project Name & Address

STEVEN MICHALETZ RESIDENCE
32865 382ND PL, AITKIN, MN 56431
AHJ: AITKIN COUNTY
UTILITY: MILLE LACS ELECTRIC COOPERATIVE

DESIGNED BY:



TRIVENT CAD SOLUTION

Sheet Name

COVER SHEET

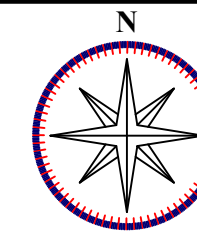
Sheet Size

ANSI B
11" X 17"

Sheet Number

PV 0.0

NO FENCES OR GATES SURROUND THE PROPERTY



SYSTEM LEGEND

LOT: 40.00 ACRES
 PARCEL: 241095200
 ——— PROPERTY LINE
 - - - - - DRIVEWAY

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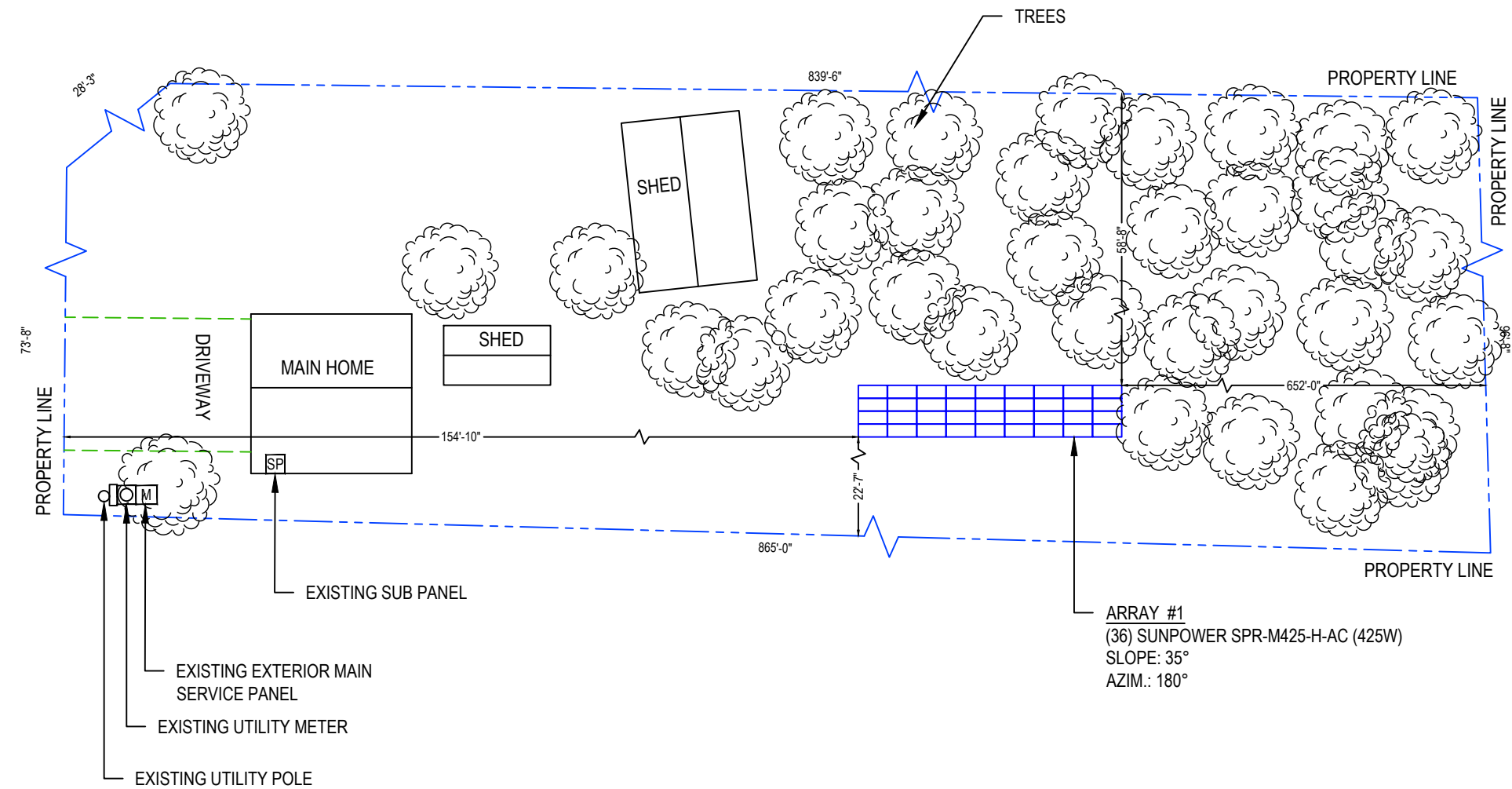
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PLOT PLAN

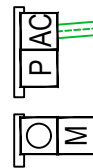
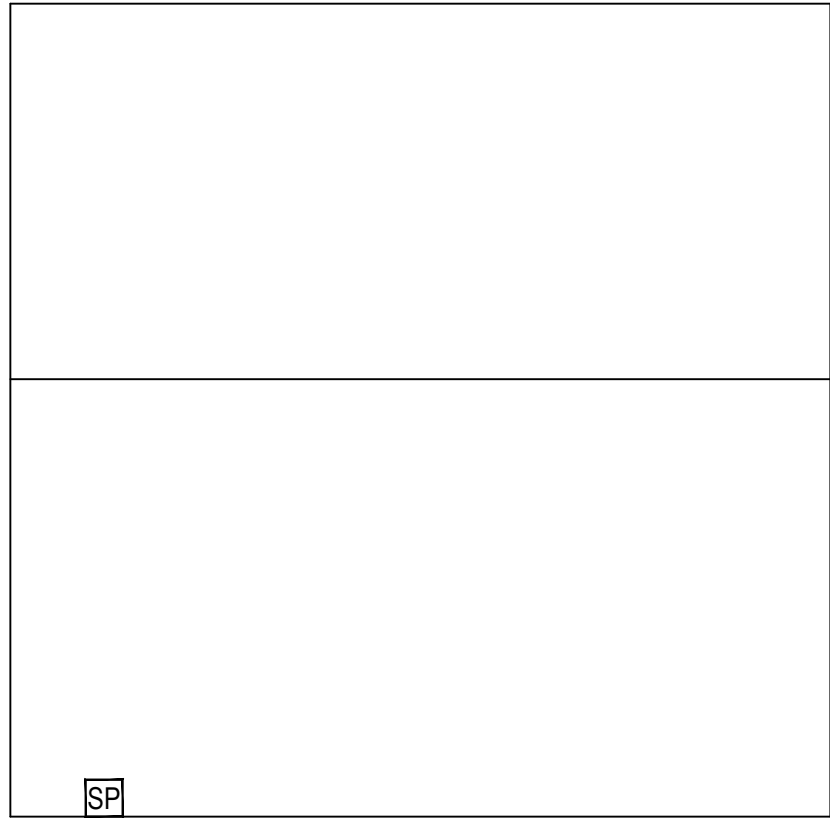
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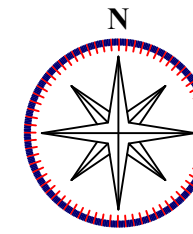
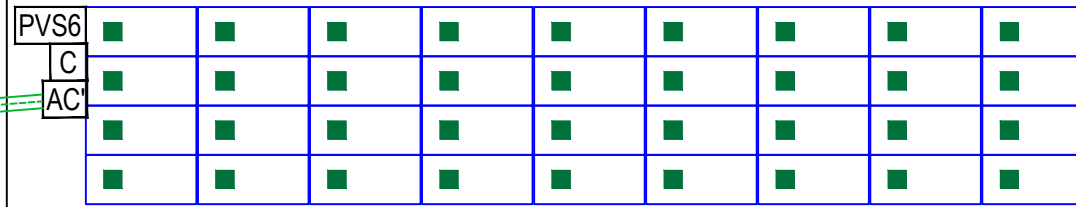
32865 382ND PL
 FRONT OF HOUSE



32865 382ND PL
FRONT OF HOUSE



NEW DIRECT BURIAL CONDUCTORS
TRENCH ~175' LENGTH AND 24" DEPTH



SYSTEM LEGEND

- EXISTING EXTERIOR UTILITY METER #152 486 167.
- EXISTING EXTERIOR MAIN SERVICE PANEL. TIED TO EXTERIOR UTILITY METER #152 486 167.
- EXISTING INTERIOR SUB PANEL.
- NEW UTILITY AC DISCONNECT SWITCH.
- NEW AC BREAKER DISCONNECT SWITCH.
- NEW DEDICATED PV SYSTEM COMBINER PANEL.
- NEW SUNPOWER PVS6 MONITORING SYSTEM.
- 36 NEW SUNPOWER SPR-M425-H-AC (425W) MODULES
NEW 36 - ENPHASE IQ7HS-66-M-US (SPWR-A5) INVERTERS, MOUNTED ON THE BACK OF EACH MODULE.
- = TRENCHED CONDUCTORS RUN
- = CONDUIT JUNCTION BOX

ARRAY SECTIONS

ARRAY #01
MODULE - 36
SLOPE - 35°
AZIMUTH - 180°

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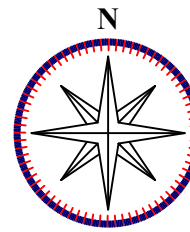
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SITE PLAN

Sheet Size
**ANSI B
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Sheet Number
PV 1.0


TOTAL MODULE AREA: 748ft

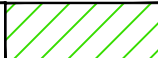
- NOTE:
- 24/ 7 UNESCORTED KEYLESS ACCESS IS TO BE PROVIDED FOR ALL UTILITY EQUIPMENT.
 - DISTANCE BETWEEN ALL EQUIPMENTS IS MAXIMUM 10".

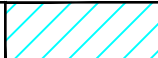


CIRCUIT(S)

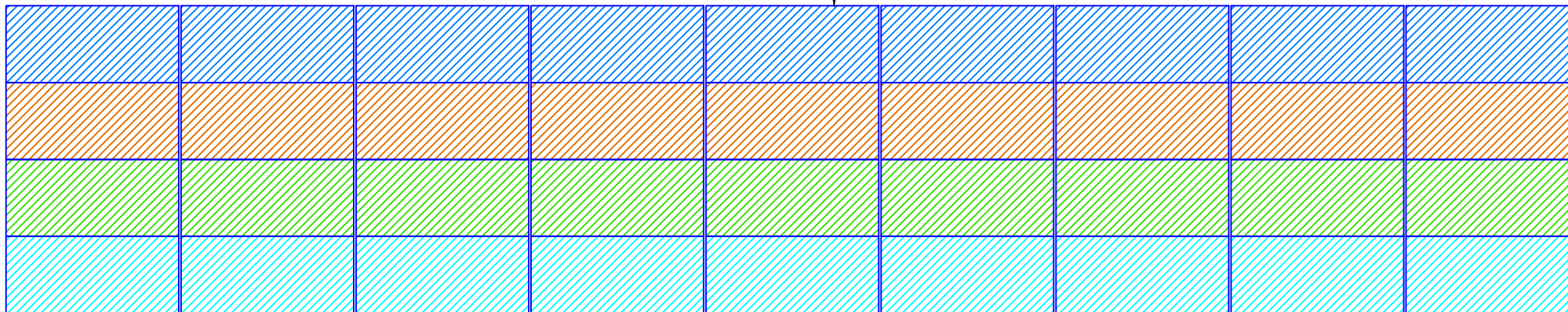
CIRCUIT #01 
MODULE - 09

CIRCUIT #02 
MODULE - 09

CIRCUIT #03 
MODULE - 09

CIRCUIT #04 
MODULE - 09

ARRAY #1
(36) SUNPOWER SPR-M425-H-AC (425W)
SLOPE: 35°
AZIM.: 180°



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TRIVENT CAD SOLUTION

Sheet Name

**ATTACHMENT &
STRING LAYOUT**

Sheet Size

**ANSI B
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Sheet Number

PV 1.1

1

STRING LAYOUT

PV 1.1

SCALE: 3/16" = 1'-0"



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Sheet Name

MOUNT DETAIL

Sheet Size

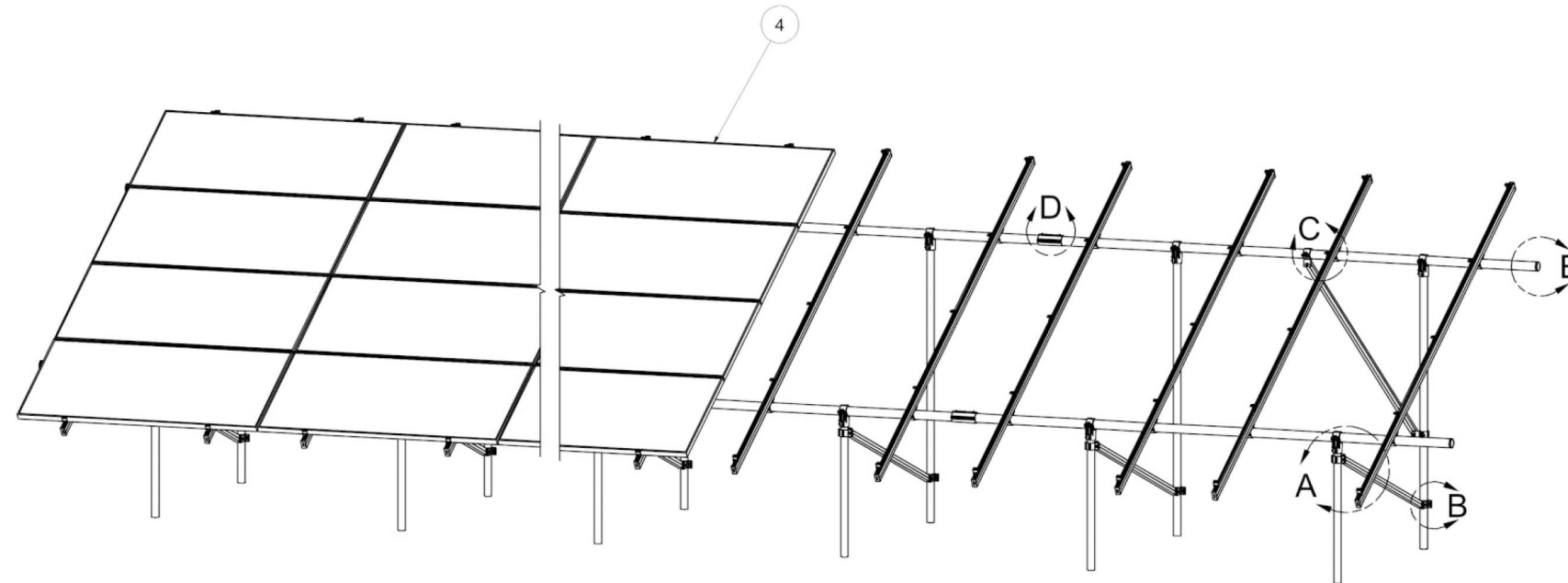
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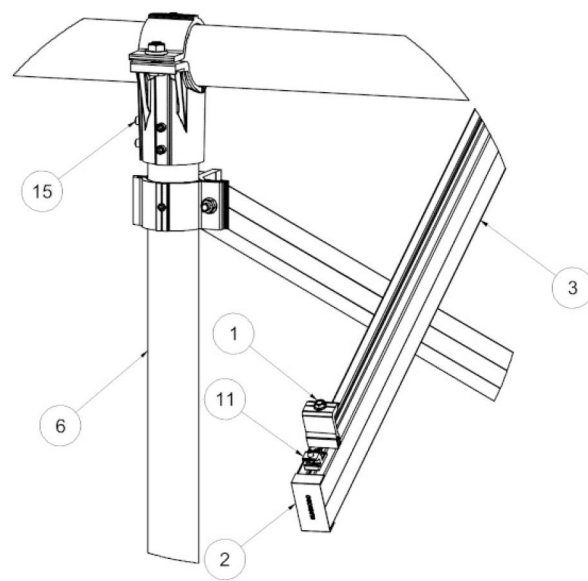
S 1.0

PACKET A9	
Model Code	ASCE 7-16
Exposure Category	C
Wind Speed	105
Ground Snow Load	60
Tilt	35

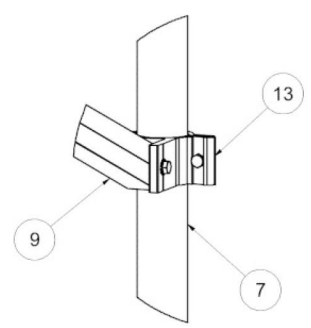
4LX9 ARRAY



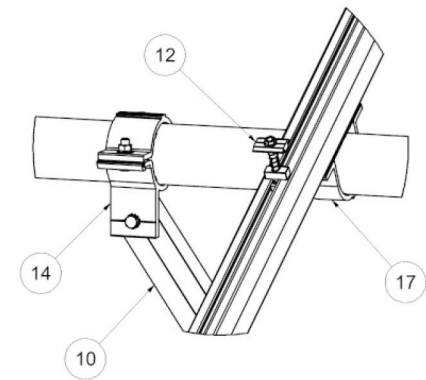
- NOTES: UNLESS OTHERWISE SPECIFIED**
- THIS DRAWING IS NOT FOR CONSTRUCTION UNTIL ENGINEERING HAS REVIEWED AND STAMPED THIS DOCUMENT.
 - DIMENSIONS SHOWN ARE INCHES.
 - THE SELF-BONDING SYSTEM AND SINGLE GROUND LUG IS FOR USE WITH PV MODULES THAT HAVE A MAXIMUM SERIES FUSE RATING OF 30A.
 - MATERIALS ARE AS SPECIFIED OR EQUIVALENT:
 HARDWARE: 304 STAINLESS STEEL
 FABRICATED EXTRUDED PARTS: 6005-T5 ALUMINUM ALLOY
 FABRICATED DIE CAST PARTS: ANSI/AA A380 ALUMINUM ALLOY
 STEEL PIPE: SCHEDULE 40 GALVANIZED
 ALUMINUM PIPE: SCHEDULE 10 ANODIZED
 - THE MAXIMUM PERMISSIBLE LENGTH OF ANY STRUCTURE SHALL BE 200 FT. FOR SYSTEMS USING A SHARED RAIL CONFIGURATION, A THERMAL BREAK IS REQUIRED IN THE RAIL EVERY 40 FT. PER THE DRAWING DETAILS.
 - 4LX9-35DEG-STR-GSM-AGM-BGM-PGM
 - APPROVED RAIL PROFILES VARY BASED ON ENGINEERING REQUIREMENTS. CONFIRM SELECTION WITH STRUCTURAL ENGINEER. SEE BOM IN BOTTOM RIGHT CORNER.
 - K10224-XXX END CLAMP KIT OR K10299-XXX ADJ. END CLAMP KIT.
 - FOUNDATION TYPES:
 GSM = GROUND SCREW GROUND MOUNT
 AGM = HELICAL AUGER GROUND MOUNT
 PGM = POST-IN-CONCRETE GROUND MOUNT
 BSM = BALLAST GROUND MOUNT
 - 1 OF 1 ARRAY TYPES
 - 1 ARRAYS TOTAL



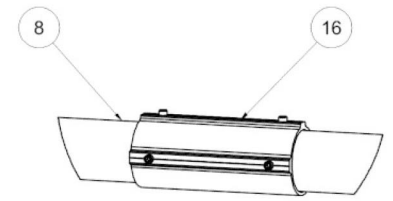
DETAIL A



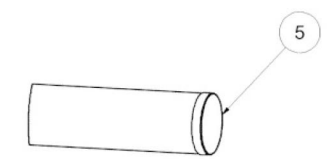
DETAIL B



DETAIL C



DETAIL D



DETAIL E

ITEM	PART NUMBER	DESCRIPTION	QTY
17	K10343-005	2.5" Pipe U-Clamp Kit	36
16	K10342-001	2.5" Pipe Splice Kit	10
15	K10341-002	2.5" Pipe T-Cap Kit	20
14	K10222-001	2.5" Pipe Clamp Kit	2
13	K10219-001	2" Pipe Clamp Kit	22
12	K10417-003	Mid Clamp, SMR Pop-on	54
11	K10469-001	SMR Grounding Lug	1
10	A50164-066	HSS E/W Tube Brace	2
9	A50164-092	HSS N/S Tube Brace	10
8	A21168-112	2.875" OD E/W Pipe Beam, 112"	12
7	A21165-060	HSS 2.375" OD Front Pipe	10
6	A21165-120	HSS 2.375" OD Rear Pipe	10
5	A20380-001	2.5" PIPE END CAP (OPTIONAL)	4
4		Panel 1,872 x1,031 x40.0mm	36
3	A20444-174-ML	SMR300 Rail, 174"	18
2	A20445-001	Rail End Cap, SMR300	36
1	K10418-003	End Clamp, SMR Pop-On	36

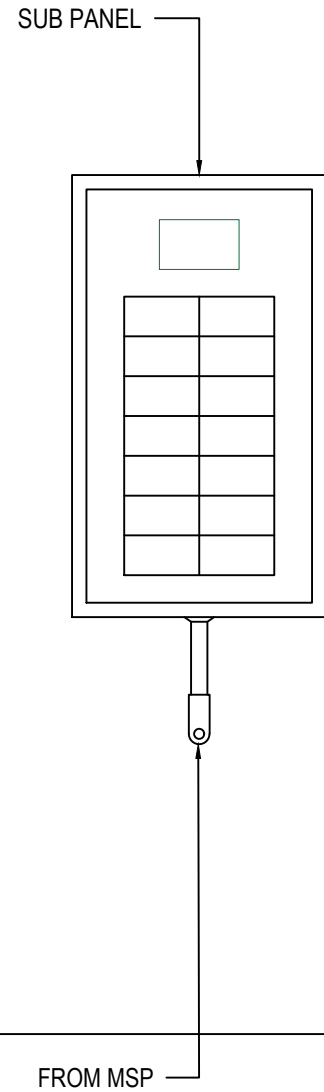
SunModo Corp.
 14800 NE 65TH STREET, VANCOUVER WA 98682

TITLE: **STEVEN MICHALETZ**
 DRAWING NUMBER: **4AA655**

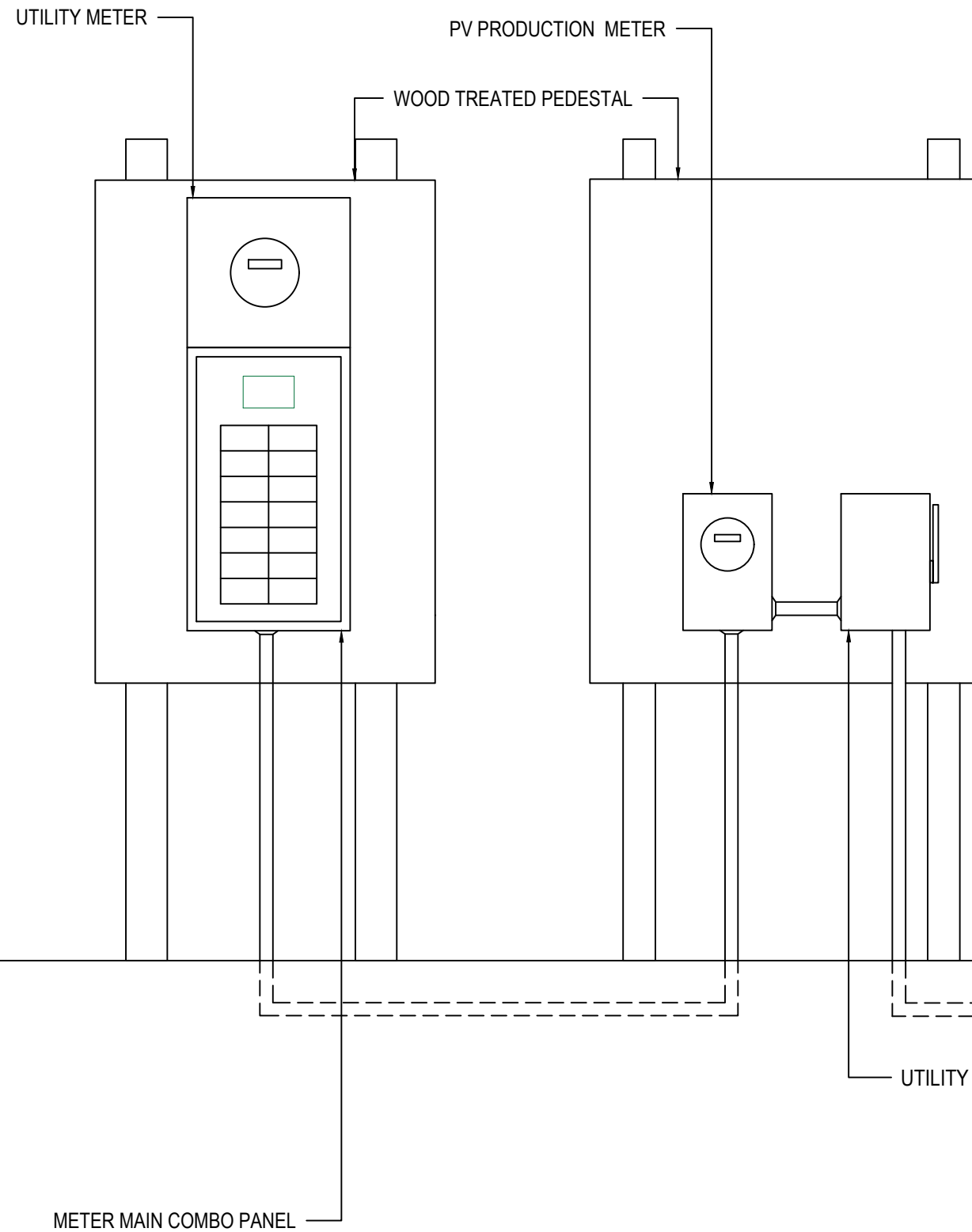
SCALE: N.T.S. SHEET 1 of 4

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INTERIOR HOUSE

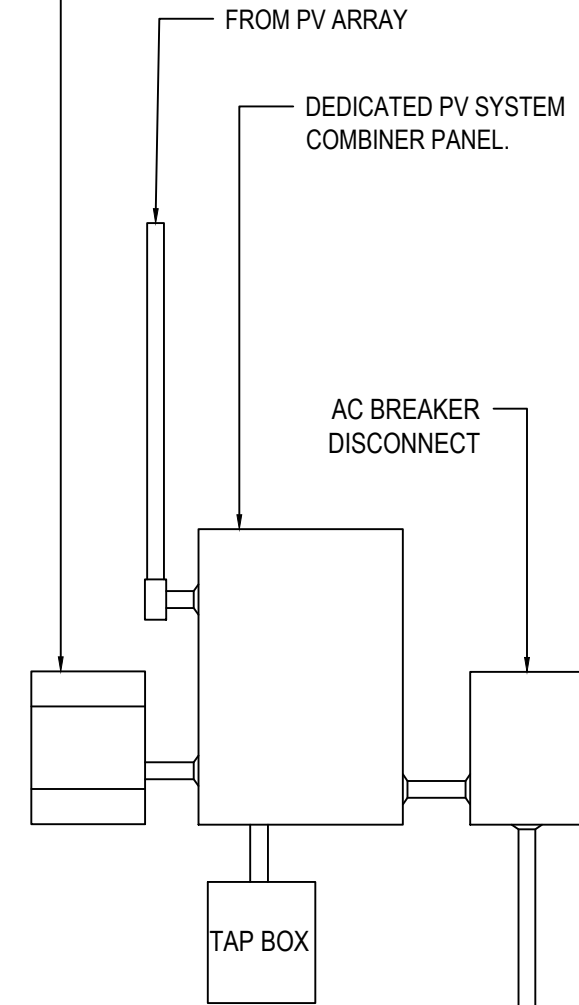


UTILITY POLE



SUNPOWER PVS6
MONITORING SYSTEM.

PV ARRAY



FROM PV ARRAY

DEDICATED PV SYSTEM
COMBINER PANEL.

AC BREAKER
DISCONNECT

TAP BOX

UTILITY AC DISCONNECT SWITCH

METER MAIN COMBO PANEL

FROM MSP



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TRIVENT CAD SOLUTION

Sheet Name
**EQUIPMENT
ELEVATION**

Sheet Size

**ANSI B
11" X 17"**

Sheet Number

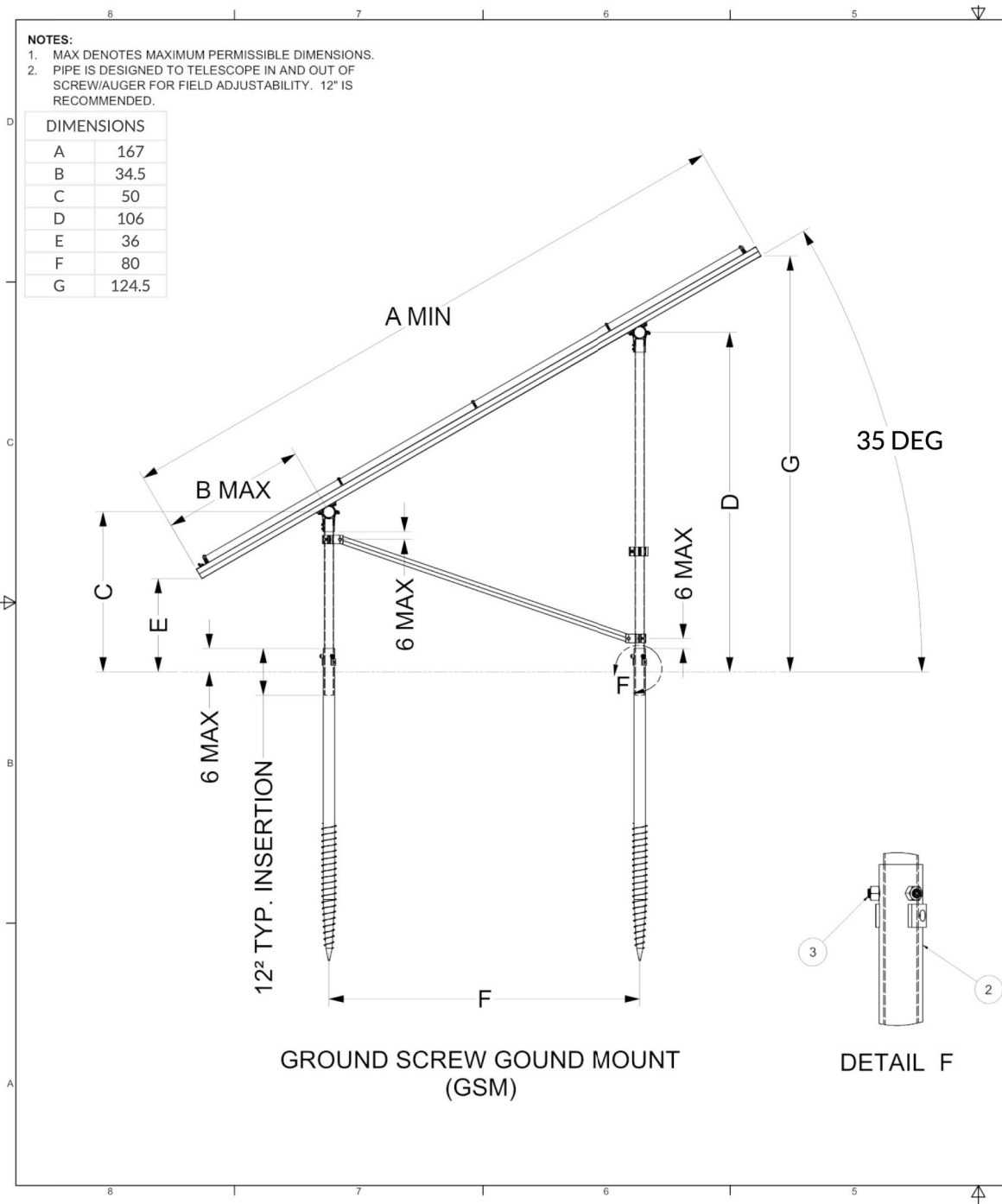
PV 1.2

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EQUIPMENT ELEVATION

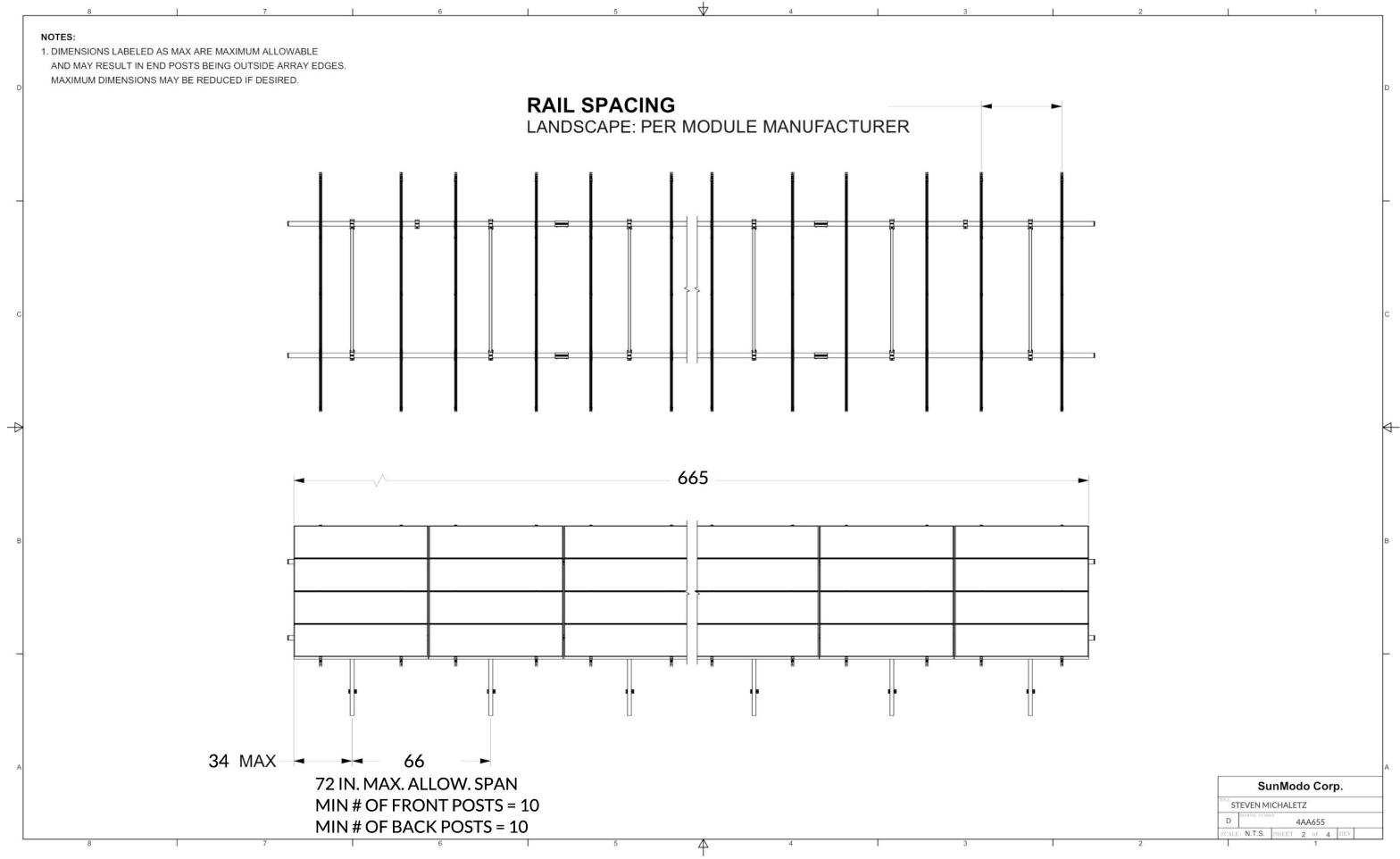
PV 1.2

SCALE: NTS



SIDE VIEW

TOTAL MODULE AREA: 831ft



TOP & ELEVATION VIEW

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MOUNT DETAIL

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S 1.1

1 MOUNT DETAIL

S 1.1 SCALE: NTS

NOTE:

- 24/7 UNESCORTED KEYLESS ACCESS IS TO BE PROVIDED FOR ALL UTILITY EQUIPMENT.
- DISTANCE BETWEEN ALL EQUIPMENTS IS MAXIMUM 10".

AHJ: AITKIN COUNTY
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PV MODULE RATING @ STC	
MANUFACTURER	SUNPOWER SPR-M425-H-AC (425W)
OUTPUT POWER	425W
POWER TOLERANCE	+5/-0%
MODULE EFFICIENCY	22.00%
TEMP. COEF. (POWER)	-0.29% / °C

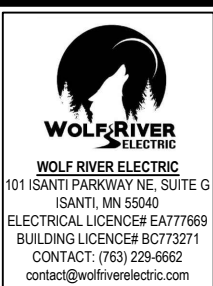
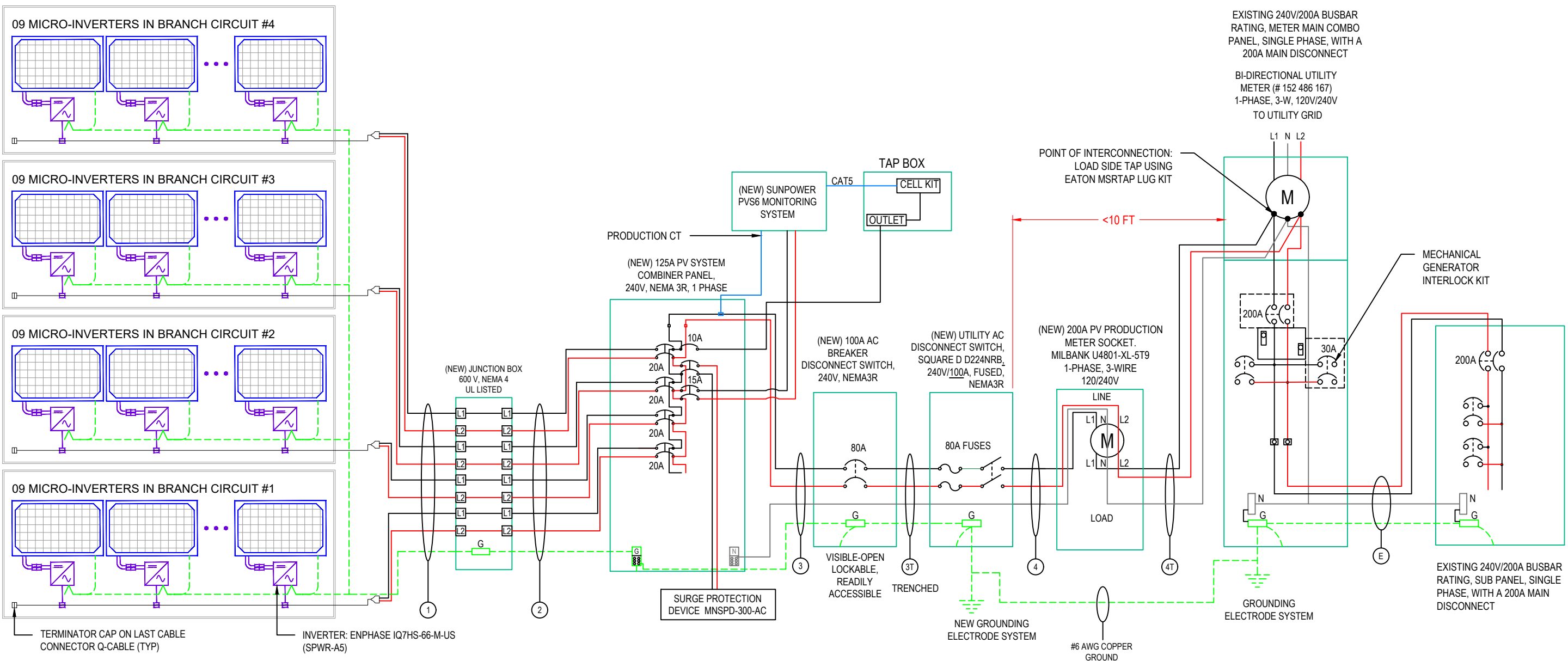
AC DISCONNECT TO BE INSTALLED WITHIN 10FT FROM UTILITY METER.

Photovoltaic System	
DC System Size (Watts)	15300
AC System Size (Watts)	13824
Total Module Count	36

INVERTER SPECIFICATIONS	
MANUFACTURER	ENPHASE IQ7HS-66-M-US (SPWR-A5)
MAX. DC VOLT RATING	59 VOLTS
MAX. POWER AT 40 C	384 WATTS
NOMINAL AC VOLTAGE	240 VOLTS
MAX. AC CURRENT	1.60 AMPS
MAX. OCPD RATING	20 AMPS
MAX. PANELS/CIRCUIT	10
SHORT CIRCUIT CURRENT	15 AMPS

Conduit Conductor Schedule (Unless Otherwise Specified Conductors Shall be Copper)					
Tag #	Description	Wire Gauge	# of Conductors/Color	Conduit Type	Conduit Size
1	Inverter Output (Enphase Q Cable)	12 AWG	8(4L1, 4L2)	Free Air	N/A
1	EGC (Bare Copper Ground)	6 AWG	1 BARE	Free Air	N/A
2	Inverter Output (THWN-2)	12 AWG	8(4L1, 4L2)	SCH 80 PVC	1"
2	EGC (THWN-2)	12 AWG	1 (GRN)	SCH 80 PVC	1"
3T	Inverter Output (URD)	2 AWG (AL)	3(L1, L2, N) B/R/W	N/A	N/A
3T	EGC (URD)	4 AWG (AL)	1 (GRN)	N/A	N/A
3	Inverter Output (THWN-2)	2 AWG (AL)	3(L1, L2, N) B/R/W	SCH 80 PVC	1-1/2"
3	EGC (THWN-2)	6 AWG (AL)	1 (GRN)	SCH 80 PVC	1-1/2"
4T	Inverter Output (URD)	2 AWG (AL)	3(L1, L2, N) B/R/W	N/A	N/A
4	Inverter Output (THWN-2)	2 AWG (AL)	3(L1, L2, N) B/R/W	SCH 80 PVC	1-1/2"

36 NEW SUNPOWER SPR-M425-H-AC (425W) MODULES
NEW 36 - ENPHASE IQ7HS-66-M-US (SPWR-A5) INVERTERS,
MOUNTED ON THE BACK OF EACH MODULE.



REVISIONS		
Description	Date	Rev
CAD 1	03-May-2024	00
CAD 2	06-May-2024	01
CAD 3	09-May-2024	02

Signature with Seal

Project Name & Address

STEVEN MICHALETZ RESIDENCE
32865 382ND PL, AITKIN, MN 56431
AHJ: AITKIN COUNTY
UTILITY: MILLE LACS ELECTRIC COOPERATIVE

DESIGNED BY:
TRIVENTCAD
TRIVENT CAD SOLUTION

Sheet Size
**ANSI B
11" X 17"**

Sheet Number
E 1.1

PV MODULE RATING @ STC	
MANUFACTURER	SUNPOWER SPR-M425-H-AC (425W)
OUTPUT POWER	425W
POWER TOLERANCE	+5/-0%
MODULE EFFICIENCY	22.00%
TEMP. COEF. (POWER)	-0.29% / °C

INVERTER SPECIFICATIONS	
MANUFACTURER	ENPHASE IQ7HS-66-M-US (SPWR-A5)
MAX. DC VOLT RATING	59 VOLTS
MAX. POWER AT 40 C	384 WATTS
NOMINAL AC VOLTAGE	240 VOLTS
MAX. AC CURRENT	1.60 AMPS
MAX. OCPD RATING	20 AMPS
MAX. PANELS/CIRCUIT	10
SHORT CIRCUIT CURRENT	15 AMPS

Rooftop conductor ampacities designed in compliance with art. 690.8, Tables 310.15(B)(16), 310.15(B)(2)(a). Location specific temperature obtained from ASHRAE 2017 data tables	
RECORD LOW TEMP	-31°
AMBIENT TEMP (HIGH TEMP 2%)	29°
CONDUIT HEIGHT	7/8"
CONDUCTOR TEMPERATURE RATE ON ARRAY / TRENCH	90°

THIS PANEL IS FED BY MULTIPLE SOURCES (UTILITY AND SOLAR)	
AC OUTPUT CURRENT ACCORDING TO ART. 690.8(B)(1)	57.60A
NOMINAL AC VOLTAGE	240V

PERCENT OF VALUES	NUMBER OF CURRENT CARRYING CONDUCTORS IN CONDUIT
.80	4-6
.70	7-9
.50	10-20

OCPD Calculations

Breakers sized according to continuous duty output current. PV circuit nominal current based off # of modules per Circuit X (1.25[art. 690.8(A)]) X (1.60 Max AC current per micro-inverter)
 Circuit #1 = 09 modules, Output Current w/ continuous duty = 18.00 <= 20A Breaker
 Circuit #2 = 09 modules, Output Current w/ continuous duty = 18.00 <= 20A Breaker
 Circuit #3 = 09 modules, Output Current w/ continuous duty = 18.00 <= 20A Breaker
 Circuit #4 = 09 modules, Output Current w/ continuous duty = 18.00 <= 20A Breaker

system output current w/ continuous duty = 72.00 <= 80A (System OCPD)

Conductor Calculations

Wire gauge calculated from code art. 310.15(B)(16) with ambient temperature calculations from art. 310.15(B)(2)(a).
 For "Off Roof" conductors we use the 90°C column ampacity, the relevant ambient temperature adjustment, and raceway fill adjustments from 310.15(B)(16). Conduit shall be installed at least 1" above the roof deck.
 For "Off Roof" conductors we use the 75°C column ampacity, or the 75°C column ampacity with the relevant ambient temperature and raceway fill adjustments, whichever is less. The rating of the conductor after adjustments MUST be greater than, or equal to, the continuous duty uprated output current.
 Calculation Example - Wire Rating (90°C) x Ambient Temperature Adjustment x Conduit Fill Adjustment >= Continuous Duty Output Current
 (Tag 2 Off Roof):
 12 gauge wire rated for 30 A, 30 A x 1 x 0.7 (8 Conductors) = 21A > 18.00A
 (Tag 3T,4T Trenched Conduit):
 2 gauge wire AL rated for 100A , 100A x 1 = 100A > 72.00A (System Output Current)
 (Tag 3,4 Off Roof):
 2 gauge wire AL rated for 90A , 90A x 1 = 90A > 72.00A (System Output Current)

ELECTRICAL NOTES

- Designed according to and all code citations are relevant to the 2023 National Electrical Code.
- Tag 2-Use 100% temperature derate for conditions of use (direct sunlight off roof)
- Tag 3 - Use 100% temperature derate for conditions of use (adjusted ambient)
- System grounding & bonding designed in compliance with 690.47(C)3 and 250.64(E)
- Equipment shall be listed, tested, and marked to withstand the available short circuit current



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 TRIVENT CAD SOLUTION

Sheet Name
WIRE CALCS

Sheet Size
ANSI B 11" X 17"

Sheet Number
E 1.2

⚠ WARNING
ELECTRICAL SHOCK HAZARD

TERMINALS ON THE LINE AND
 LOAD SIDES MAY BE ENERGIZED
 IN THE OPEN POSITION

LABEL LOCATION: COMBINER PANEL, AC
 DISCONNECT, POINT OF INTERCONNECTION
 PER CODE: NEC 706.15(C)(4), NEC 690.13(B)

⚠ WARNING

TURN OFF PHOTOVOLTAIC AC
 DISCONNECT PRIOR TO
 WORKING INSIDE PANEL

LABEL LOCATION: COMBINER PANEL(S), MAIN SERVICE DISCONNECT
 PER CODE: NEC 110.27(C), OSHA 1910.145(f)(7)

PHOTOVOLTAIC POWER SOURCE

LABEL LOCATION: DC CONDUIT/RACEWAYS
 PER CODE: NEC 690.31(D)(2)

PHOTOVOLTAIC SYSTEM AC DISCONNECT
 RATED AC OUPUT CURRENT: 57.60 A
 NOMINAL OPERATING AC VOLTAGE: 240 V

LABEL LOCATION: AC DISCONNECT/POINT OF INTERCONNECTION
 PER CODE: NEC 690.54

PHOTOVOLTAIC

AC DISCONNECT

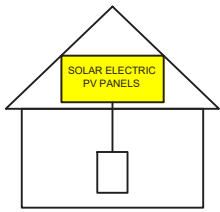
LABEL LOCATION: AC DISCONNECT
 PER CODE: NEC 690.13(B)

⚠ WARNING DUAL POWER SOURCE
SECOND SOURCE IS PHOTOVOLTAIC SYSTEM

LABEL LOCATION: MAIN SERVICE DISCONNECT, PRODUCTION/NET METER
 PER CODE: NEC 690.59, 705.12(C)

**SOLAR PV SYSTEM EQUIPPED
 WITH RAPID SHUTDOWN**

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



LABEL LOCATION: MAIN SERVICE DISCONNECT
 PER CODE: NEC 690.56(C)

**MAIN PHOTOVOLTAIC
 SYSTEM DISCONNECT**

LABEL LOCATION: MAIN SERVICE DISCONNECT, UTILITY METER
 PER CODE: NEC 690.13(B)

**RAPID SHUTDOWN FOR
 SOLAR PV SYSTEM**

LABEL LOCATION: RSD INITIATION DEVICE, AC DISCONNECT
 PER CODE: NEC 690.56(C)(2)

**DO NOT DISCONNECT
 UNDER LOAD**

LABEL LOCATION: MAIN SERVICE DISCONNECT
 PER CODE: NEC 690.15(B) & NEC 690.33(D)(2)



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DESIGNED BY:



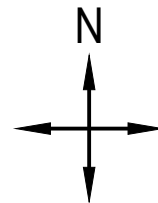
TRIVENTCAD SOLUTION

Sheet Name
**WARNING
 LABELS**

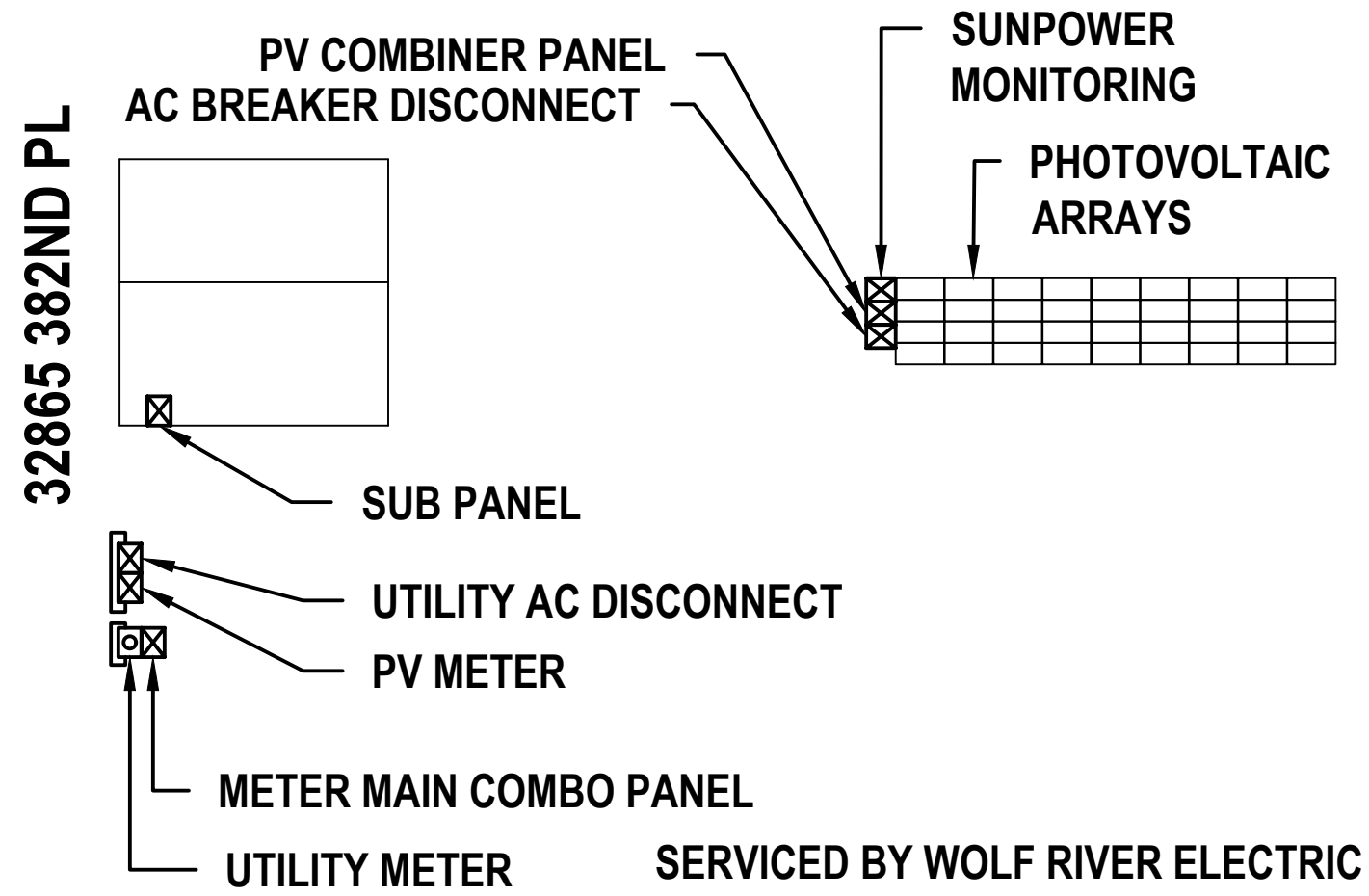
Sheet Size
**ANSI B
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Sheet Number
E 1.3

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



32865 382ND PL



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TRIVENT CAD SOLUTION

Sheet Name

PLACARD

Sheet Size

ANSI B
 11" X 17"

Sheet Number

E 1.4



SUNPOWER®

M-Series: M440 | M435 | M430 | M425 | M420 SunPower® Residential AC Module



420-440W Residential AC Module

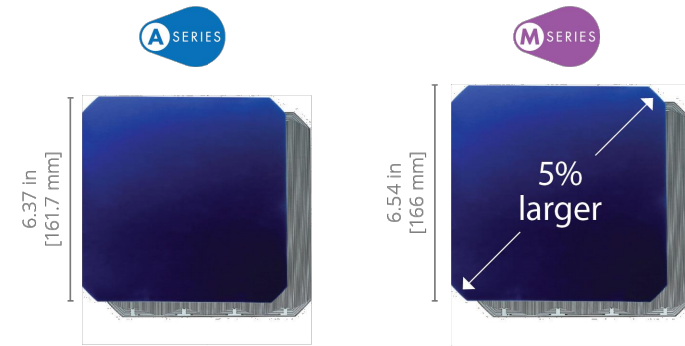
SunPower® Maxeon® Technology

Built specifically for use with the SunPower Equinox® system, the only fully integrated solar solution designed, engineered, and warranted by one company.



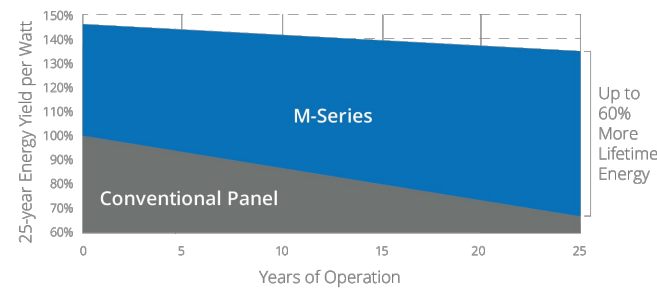
Highest Power AC Density Available.

The patented, solid-copper foundation Maxeon Gen 6 cell is over 5% larger than prior generations, delivering the highest efficiency AC solar panel available.¹



Highest Lifetime Energy and Savings

Designed to deliver 60% more energy over 25 years in real-world conditions like partial shade and high temperatures.²

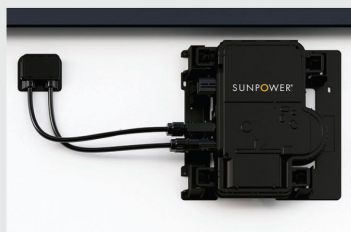


Best Reliability, Best Warranty

With more than 42.6 million and 15 GW modules deployed around the world, SunPower technology is proven to last. That's why we stand behind our module and microinverter with the industry's best 25-year Combined Power and Product Warranty.

Part of the SunPower Equinox® Solar System

- Compatible with mySunPower™ monitoring
- Seamless aesthetics



Factory-integrated Microinverter

- Highest-power integrated AC module in solar
- Engineered and calibrated by SunPower for SunPower AC modules

AC Electrical Data		
Inverter Model: Type H (Enphase IQ7HS)	@240 VAC	@208 VAC
Max. Continuous Output Power (VA)	384	369
Nom. (L-L) Voltage/Range ³ (V)	240 / 211–264	208 / 183–229
Max. Continuous Output Current (Arms)	1.60	1.77
Max. Units per 20 A (L-L) Branch Circuit ⁴	10	9
CEC Weighted Efficiency	97.0%	96.5%
Nom. Frequency	60 Hz	
Extended Frequency Range	47–68 Hz	
AC Short Circuit Fault Current Over 3 Cycles	4.82 A rms	
Overvoltage Class AC Port	III	
AC Port Backfeed Current	18 mA	
Power Factor Setting	1.0	
Power Factor (adjustable)	0.85 (inductive) / 0.85 (capacitive)	

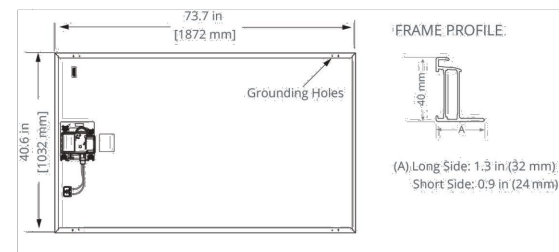
	DC Power Data				
	SPR-M440-H-AC	SPR-M435-H-AC	SPR-M430-H-AC	SPR-M425-H-AC	SPR-M420-H-AC
Nom. Power ⁶ (P _{nom}) W	440	435	430	425	420
Power Tolerance	+5/-0%				
Module Efficiency	22.8%	22.5%	22.3%	22.0%	21.7%
Temp. Coef. (Power)	-0.29% / °C				
Shade Tolerance	Integrated module-level max. power point tracking				

Tested Operating Conditions	
Operating Temp.	-40° F to +185°F (-40°C to +85°C)
Max. Ambient Temp.	122°F (50°C)
Max. Test Load ⁸	Wind: 125 psf, 6000 Pa, 611 kg/m ² back Snow: 187 psf, 9000 Pa, 917 kg/m ² front
Max. Design Load	Wind: 75 psf, 3600 Pa, 367 kg/m ² back Snow: 125 psf, 6000 Pa, 611 kg/m ² front
Impact Resistance	1 inch (25 mm) diameter hail at 52 mph (23 m/s)

Mechanical Data	
Solar Cells	66 Maxeon Gen 6
Front Glass	High-transmission tempered glass with anti-reflective coating
Environmental Rating	Outdoor rated
Frame	Class 1 black anodized (highest AAMA rating)
Weight	48 lb (21.8 kg)
Recommended Max. Module Spacing	1.3 in. (33 mm)

Warranties, Certifications, and Compliance	
Warranties	<ul style="list-style-type: none"> • 25-year limited power warranty • 25-year limited product warranty
Certifications and Compliance	<ul style="list-style-type: none"> • UL 1741 / IEEE-1547 • UL 1741 AC Module (Type 2 fire rated) • UL 61730 • UL 62109-1 / IEC 62109-2 • FCC Part 15 Class B • ICES-0003 Class B • CAN/CSA-C22.2 NO. 107.1-01 • CA Rule 21 (UL 1741 SA)⁵ (includes Volt/Var and Reactive Power Priority) • UL Listed PV Rapid Shutdown Equipment⁷ <p>Enables installation in accordance with:</p> <ul style="list-style-type: none"> • NEC 690.6 (AC module) • NEC 690.12 Rapid Shutdown (inside and outside the array) • NEC 690.15 AC Connectors, 690.33(A)-(E)(1) <p>When used with AC module Q Cables and accessories (UL 6703 and UL 2238):</p> <ul style="list-style-type: none"> • Rated for load break disconnect
PID Test	1000 V: IEC 62804

Packaging Configuration	
Modules per pallet	25
Packaging box dimensions	75.4 × 42.2 × 48.0 in. (1915 × 1072 × 1220 mm)
Pallet gross weight	1300.7 lb (590 kg)
Pallets per container	32
Net weight per container	41,623 lb (18,880 kg)



Please read the safety and installation instructions for details.



539973 RevB
January 2022

See www.sunpower.com/company for more reference information. Specifications included in this datasheet are subject to change without notice.

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REVISIONS

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TRIVENT CAD SOLUTION

Sheet Name
MODULE SPEC SHEET

Sheet Size

ANSI B 11" X 17"

Sheet Number

D 1.1

Enphase SPWR-A5 (IQ7HS) Microinverter

The high-powered smart grid-ready **Enphase SPWR-A5 Microinverter™** with integrated MC4 connectors dramatically simplify the installation process while achieving the highest system efficiency.

The IQ Series Microinverters extend the reliability standards set forth by previous generations and undergo over a million hours of power-on testing, enabling Enphase to provide an industry-leading warranty of up to 25 years.



Easy to Install

- Lightweight and simple
- Faster installation with improved, lighter two-wire cabling
- Built-in rapid shutdown compliant (NEC 2014 & 2017)

Efficient and Reliable

- Optimized for high powered 66-cell* modules
- Highest CEC efficiency of 97.0%
- More than a million hours of testing
- Class II double-insulated enclosure
- UL listed

Smart Grid Ready

- Complies with advanced grid support, voltage and frequency ride-through requirements
- Remotely updates to respond to changing grid requirements
- Configurable for varying grid profiles
- Meets CA Rule 21 (UL 1741-SA)

* The IQ7HS is required to support 66-cell modules.



To learn more about Enphase offerings, visit enphase.com



Enphase IQ7HS Microinverter

INPUT DATA (DC)		IQ7HS-66-M-US	
Commonly used module pairings ¹	320 W - 460 W +		
Module compatibility	66-cell PV modules		
Maximum input DC voltage	59 V		
Peak power tracking voltage	38 V - 43 V		
Operating range	20 V - 59 V		
Min/Max start voltage	30 V / 59 V		
Max DC short circuit current (module I _{sc})	15 A		
Overvoltage class DC port	II		
DC port backfeed current	0 A		
PV array configuration	1 x 1 ungrounded array; No additional DC side protection required; AC side protection requires max 20A per branch circuit		
OUTPUT DATA (AC)		@240 VAC	@208 VAC
Peak output power	384 VA	369 VA	
Maximum continuous output power	384 VA	369 VA	
Nominal (L-L) voltage/range ²	240 V / 211-264 V	208 V / 183-229 V	
Maximum continuous output current	1.60 A (240V)	1.77 A (208V)	
Nominal frequency	60 Hz	60 Hz	
Extended frequency range	47 to 68 Hz	47 to 68 Hz	
AC short circuit fault current over 3 cycles	4.82 A	4.82 A	
Maximum units per 20 A (L-L) branch circuit ³	10	9	
Overvoltage class AC port	III	III	
AC port backfeed current	18 mA	18 mA	
Power factor setting	1.0	1.0	
Power factor (adjustable)	0.85 leading ...0.85 lagging	0.85 leading ...0.85 lagging	
EFFICIENCY		@240 V	@208 V
CEC weighted efficiency	97.0 %	96.5 %	
MECHANICAL DATA			
Ambient temperature range	-40°C to +60°C		
Relative humidity range	4% to 100% (condensing)		
Connector type	Staubli made MC4		
Dimensions (WxHxD)	212 mm x 175 mm x 30.2 mm (without bracket)		
Weight	1.08 kg (2.38 lbs)		
Cooling	Natural convection - No fans		
Approved for wet locations	Yes		
Pollution degree	PD3		
Enclosure	Class II, corrosion resistant polymeric enclosure		
Environmental category / UV exposure rating	NEMA type 6 / outdoor		
Altitude	2000m		
FEATURES			
Communication	Power Line Communication (PLC)		
Disconnecting means	The AC and DC connectors have been evaluated and approved by UL for use as the load-break disconnect means required by NEC 690 and C22.1-2018 Rule 64-220.		
Compliance	CA Rule 21 (UL 1741-SA), HECO v1.1 UL 62109-1, UL1741/IEEE1547, FCC Part 15 Class B, ICES-0003 Class B, CAN/CSA-C22.2 NO. 107.1-01 This product is UL Listed as PV Rapid Shut Down Equipment and conforms with NEC-2014 and NEC-2017 section 690.12 and C22.1-2015 Rule 64-218 Rapid Shutdown of PV Systems, for AC and DC conductors, when installed according to manufacturer's instructions.		

1. No enforced DC/AC ratio. See the compatibility calculator at <https://enphase.com/en-us/support/module-compatibility>.
 2. Nominal voltage range can be extended beyond nominal if required by the utility.
 3. Limits may vary. Refer to local requirements to define the number of microinverters per branch in your area.

To learn more about Enphase offerings, visit enphase.com

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Sheet Name

**INVERTER
 SPEC SHEET**

Sheet Size

**ANSI B
 11" X 17"**

Sheet Number

D 1.2

CERTIFICATE OF COMPLIANCE

Certificate Number 20220608-E341165 SB
 Report Reference E341165-20171030
 Date 2022-08-19

Issued to: Enphase Energy Inc.
 1420 N. McDowell Blvd. Petaluma, CA 94954-6515

This is to certify that representative samples of

Photovoltaic Grid Support Utility Interactive Inverter with Rapid Shutdown Functionality
 Models IQ7-60, IQ7PLUS-72, IQ7X-96, IQ7XS-96, may be f/b -2, -5, -E or -M, may be f/b -ACM, f/b -US, may be f/b -NM, may be f/b -RMA, may be f/b -&, where "&" designates additional characters.
 Models IQ7A, may be f/b S, f/b -66 or -72, may be f/b -2, -5, -E or -M, may be f/b -ACM, f/b -US, may be f/b -NM, may be f/b -RMA, may be f/b -&, where "&" designates additional characters.
 Model IQ7PD-72-2-US, may be f/b -&, where "&" designates additional characters.
 Model IQ7PD-84-2-US may be f/b -&, where "&" designates additional characters.
 Models IQ7HS, may be f/b -66 or -72, may be f/b -2, -5, -M or -E, may be f/b -ACM, f/b -US, may be f/b -NM, may be f/b -RMA, may be f/b -&, where "&" designates additional characters

Have been investigated by UL in accordance with the Standard(s) indicated on this Certificate.

Standard(s) for Safety: See Page 2

Additional Information: See the UL Online Certifications Directory at www.ul.com/database for additional information

This Certificate of Compliance does not provide authorization to apply the UL Mark. Only the UL Follow-Up Services Procedure provides authorization to apply the UL Mark.

Only those products bearing the UL Mark should be considered as being UL Certified and covered under UL's Follow-Up Services.

Look for the UL Certification Mark on the product.

B. Mahrenholz

Bruce Mahrenholz, Director North American Certification Program

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Certificate Number 20220608-E341165 SB
 Report Reference E341165-20171030
 Date 2022-08-19

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This is to certify that representative samples of the product as specified on this certificate were tested according to the current UL requirements. Standards for Safety:

UL 1741, Inverters, Converters, Controllers and Interconnection System Equipment for Use With Distributed Energy Resources, Edition 3, Issue Date 09/28/2021. Including the requirements in UL 1741 Supplement SA and SB.

IEEE 1547, Interconnection and Interoperability of Distributed Energy Resources (DERs) with Associated Electric Power Systems (EPSs) Interfaces, Issue Date 02/15/2018

IEEE 1547.1, IEEE Standard Conformance Test Procedures for Interconnecting Distributed Energy Resources (DERs) with Electric Power Systems (EPSs) Associated Interfaces, Issue Date 03/05/2020.

UL 62109-1, Safety of Converters for Use in Photovoltaic Power Systems - Part 1: General Requirements; IEC 62109-2, Safety of Power Converters for use in Photovoltaic Power Systems - Part 2: Particular Requirements for Inverters.

CSA C22.2 No. 107.1-01, General Use Power Supplies.

R21 (SA): The evaluation was based Table SA1.1 option in UL1741SA to use the IEEE 1547.1-2020 and UL1741SB test methods in conjunction with using IEEE 1547-2018 as the SRD under which SA11.2 Normal Ramp Rate is not address. Additional testing was conducted to confirmed compliance to Normal Ramp Rate SA11.2.

14H (SA): The evaluation to the Standards above provides evidence of compliance to HECO Rule 14H, SRD V1.0, Interconnection Application.

14H (SB): The evaluation to the Standards above provides evidence of compliance to HECO Rule 14H, SRD V2.0, Interconnection Application.

Inverter Firmware Version:		
UL 1998 (grid support)	Date	Version/Revision
Yes	2022-06-01	V04.40.01

B. Mahrenholz

Bruce Mahrenholz, Director North American Certification Program

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Signature with Seal

Project Name & Address

STEVEN MICHALETZ RESIDENCE
 32865 382ND PL, AITKIN, MN 56431
 AHJ: AITKIN COUNTY
 UTILITY: MILLE LACS ELECTRIC COOPERATIVE

DESIGNED BY:



TRIVENT CAD SOLUTION

Sheet Name
 INVERTER COMPLIANCE

Sheet Size

ANSI B
 11" X 17"

Sheet Number

D 1.2 A

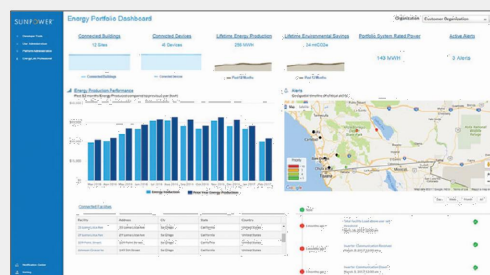


SunPower® EnergyLink™ | Residential and Commercial PVS6

Improve Support, Reduce Maintenance Costs

An intuitive monitoring website enables you to:

- See a visual map of customer sites
- Remotely manage hundreds of sites
- Receive elective system reports
- Locate system issues and remotely diagnose
- Diagnose issues online
- Drill down for the status of individual devices



Add Value for Customers

With the SunPower Monitoring System customers can:

- See what their solar system produces each day, month, or year
- Optimize their solar investment and save on energy expenses
- See their energy use and estimated bill savings
- See their solar system's performance using the SunPower monitoring website or mobile app



SunPower EnergyLink—Plug-and-Play Installation

This complete solution for residential and commercial monitoring and control includes the SunPower® PV Supervisor 6 (PVS6) which improves the installation process, overall system reliability, and customer experience.

- Compact footprint for improved aesthetics
- Robust cloud connectivity and comprehensive local connectivity
- Flexible configuration of devices during installation
- Consumption metering
- Revenue-grade production metering (pending)
- Web-based commissioning
- Remote diagnostics of PVS6 and inverters
- Durable UL Type 3R enclosure reduces maintenance costs
- Easy integration with SunPower eBOS



Robust Cloud Connectivity

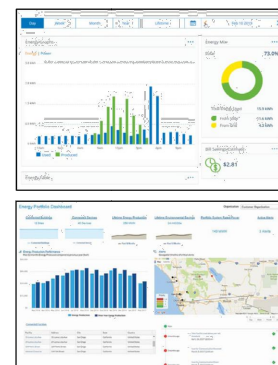
Multiple options to maintain optimal connectivity:

- Hardwired Ethernet
- Wi-Fi
- Cellular backup



SunPower® EnergyLink™ | Residential and Commercial PVS6

SunPower Monitoring Websites

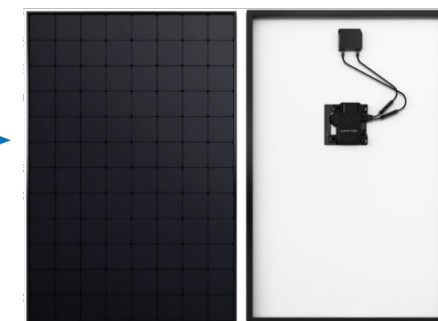


PVS6



Multiple communication options include Ethernet, Wi-Fi, and cellular.

SunPower AC Modules



Site Requirements	
Number of SunPower AC modules supported per PVS6	85
Internet access	High-speed Internet access via accessible router or switch
Power	<ul style="list-style-type: none"> • 100–240 VAC (L–N), 50 or 60 Hz • 208 VAC (L–L in 3-phase), 60 Hz

Operating Conditions	
Temperature	–22°F to +140°F (–30°C to +60°C)
Humidity (maximum)	95%, non-condensing

Mechanical	
Weight	5.5 lbs (2.5 kg)
Dimensions	11.8 × 8.0 × 4.2 in. (30.5 × 20.5 × 10.8 cm)
Enclosure rating	UL50E Type 3R

Communication	
RS-485	Inverters and meters
Integrated Metering	<ul style="list-style-type: none"> • One channel of revenue-grade production metering • Two channels of consumption metering
Ethernet	1 LAN (or optional WAN) port
PLC	PLC for SunPower AC modules
Wi-Fi	802.11b/g/n 2.4 GHz and 5 GHz
Cellular	LTE Cat-M1/3G UMTS
ZigBee	IEEE 802.15.4 MAC, 2.4GHz ISM band
Data Storage	60 days
Upgrades	Automatic firmware upgrades

Web and Mobile Device Support	
Customer site	monitor.us.sunpower.com
Partner site	pvsmgmt.us.sunpower.com
Browsers	Firefox, Safari, and Chrome
Mobile devices	iPhone®, iPad®, and Android™
Customer app	<ol style="list-style-type: none"> 1. Create account online at: monitor.us.sunpower.com. 2. On a mobile device, download the SunPower Monitoring app from Apple App Store™ or Google Play™ store. 3. Sign in using account email and password.

Warranty and Certifications	
Warranty	10-year Limited Warranty
Certifications	UL, cUL, CE, UL 61010-1 and -2, FCC Part 15 (Class B)



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530536 RevC



WOLF RIVER ELECTRIC
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REVISIONS

Description	Date	Rev
CAD 1	03-May-2024	00
CAD 2	06-May-2024	01
CAD 3	09-May-2024	02

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TRIVENT CAD SOLUTION

Sheet Name
MONITORING SPEC SHEET

Sheet Size

ANSI B 11" X 17"

Sheet Number

D 1.3



SINGLE DAY INSTALL

SunTurf® Ground Mount System



SunModo offers the next generation Ground Mount System with SunTurf. The streamlined design combines the strength of Helio Rails with steel pipes to create the perfect ground mount solution.

SunTurf is ideal for solar installers looking for a durable and cost-effective system that can accommodate a wide variety of soil conditions.

The SunTurf Ground Mount Advantage

- ✓ Easily scalable from kilowatts to multimegawatts PV Arrays.
- ✓ Foundation design solution for every soil condition.
- ✓ Online configuration tool available to streamline design process.
- ✓ Components optimized for strength, durability and fast installation.
- ✓ UL 2703 Listed by Intertek.

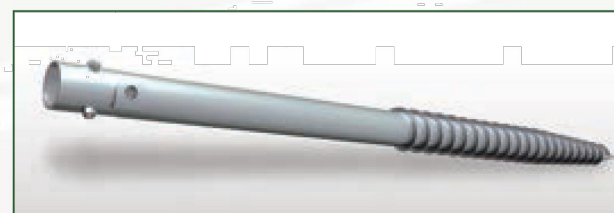
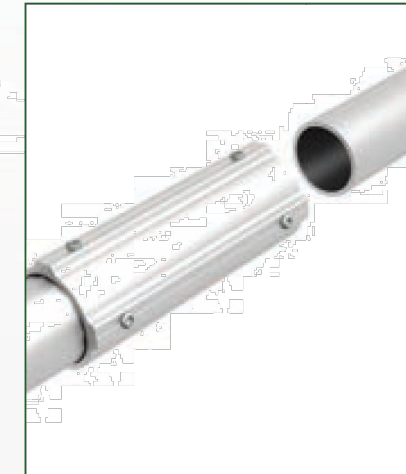
Key Features of SunTurf® Ground Mount System

SunTurf Ground Mount System easily integrate Helio Rails with Schedule 40 steel pipes. No drilling is required to attach the aluminum rails to the horizontal pipe. Optional bracing can provide additional structural rigidity for sites with high snow or wind load conditions. Anchor any ground mount installation using one of our foundation types including helical piles, precast ballasts and concrete piers.

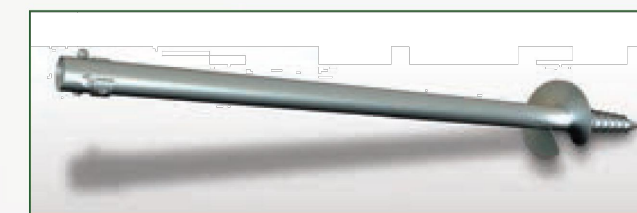


Augers and Ground Screws

Our augers are suitable for use in weak to moderate strength soils and areas with a high-water table. Our ground screws are ideal for use in hard packed earth or soils with large amounts of cobble and gravel.



Ground Screw



Earth Auger

Technical Data

Application	Ground Mount
Material	High grade aluminum, galvanized steel and 304 stainless steel hardware
Module Orientation	Portrait and Landscape
Tilt Angle	Range between 10 to 50 degrees
Foundation Types	Post in concrete, helical earth auger, ground screw anchor and ballast
Structural Integrity	Stamped engineering letters available
Certificate	UL2703 listed by ETL
Warranty	25 years

SunModo, Corp. Vancouver, WA., USA • www.sunmodo.com • 360.844.0048 • info@sunmodo.com



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Sheet Name

MOUNTING
 SPEC SHEET

Sheet Size

ANSI B
 11" X 17"

Sheet Number

D 1.4

MIDNITE SOLAR INC. Surge Protection

Surge Protection You Can Count On!

MidNite Solar Surge Protection Devices are type 1 devices, designed for indoor and outdoor applications. Engineered for both AC and PV DC electrical systems, they provide protection to service panels, load centers or electronic devices that are directly connected to a MidNite Surge Protection Device (SPD).

MidNite's SPD's are offered in four models to protect a variety of different voltage ranges. They achieve this protection by clamping surge voltage to a level that your system can sustain without damaging the components of the system.

Compare our SPD's against other surge protection devices. You will see there is no comparison in both our price and features. All our SPD's have a 5 year warranty.

With lightning you only get one chance, so get the best!



www.midnitesolar.com/spd
19115 - 62nd Ave. NE., Arlington, WA. 360-403-7207 FAX: 360-691-6862



MNSPD300ACFM (Cut-in box)
(MNSPD-300-AC included)



Four Models:

- MNSPD-115
- MNSPD-300-AC
- MNSPD-300-DC
- MNSPD-600



MidNite Surge Protection Devices

PART NUMBER	MNSPD-115	MNSPD-300-AC	MNSPD-300-DC	MNSPD-600
Nominal Voltage	0 to 90 VAC 0 to 115 VDC	0 to 250 VAC	0 to 300 VDC	0 to 480 VAC 0 to 600 VDC
MCOV	180V	470V	470V	780V
VPR Line to Ground	600V	1200V	1200V	1800V
Suggested Placement	Up to 90VAC circuits, 12V, 24V, 48VDC battery circuits	120/240 VAC circuits	Off-grid PV combiners Charge controller inputs up to 300VDC	316V/480 VAC circuits Grid-tie PV combiners Grid-tie inverter input Non-Isolated Inverters
Type	UL1449 4th Ed. Type 1	UL1449 4th Ed. Type 1	UL1449 4th Ed. Type 1	UL1449 4th Ed. Type 1
Diagnostic Blue LED	MNSPD-300-AC LED indicates when voltage is present between L1 + ground and L2 + ground MNSPD-115, MNSPD-300-DC and MNSPD-600: LED indicates when voltage is present between L1 + L2 (PV+ PV-)			
Thermal Disconnect	Internal Fuse			
Response Time	<1 micro sec.			



Performance

Surge Current Rating per Phase	80kA
Short Circuit Current Rating	10kA

Fusing: Individually fused MOVs
Thermal Fusing: Yes
Over current Fusing: Yes
Operating Frequency: 0 to 500 Hz

Mechanical Description

Enclosure	Polycarbonate UL94V-0
Environmental Rating	Type 4X
Connection Method	#12 AWG
Weight	1 lb.
Mounting Method	1/2" Conduit Knockout
Operating Altitude	Sea Level - 12,000' (3,658 Meters)
Storage Temp	-40° F to +185° F (-40° C to +85° C)
Operating Temp	-40° F to +185° F (-40° C to +85° C)

Diagnostics
Blue status LED, one per leg

Listings and Performance
UL Standard for Safety, UL 1449 Surge Protective Devices-Fourth Edition
CSA C22.2 No. 8-M1986 Electromagnetic Interference (EMI) Filters, Fourth Edition

Model No.	Max Operating Voltage	Surge Current per Phase	Configuration	MCOV	SCCR	VPR 600V/3kA L G
MNSPD-115	100 VAC/150VDC	80kA	1Ø, 3-wire (2 Legs)	180V L-N	10kA	600V
MNSPD-300-AC	300VAC	80kA	1Ø, 3-wire (2 Legs)	470V L-N	10kA	1200V
MNSPD-300-DC	385VDC	80kA	1Ø, 3-wire (2 Legs)	470V L-N	10kA	1200V
MNSPD-600	480VAC/600VDC	80kA	1Ø, 3-wire (2 Legs)	780V L-N	10kA	1800V

www.midnitesolar.com/spd
19115 - 62nd Ave NE, Arlington, WA 98223 PH. 360-403-7207 FAX 360-691-6862

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Sheet Name

SPD SPEC SHEET

Sheet Size

ANSI B
11" X 17"

Sheet Number

D 1.5

Technical Data PIMS0618

Group Metering Accessories and Renewal Parts MSRTAP



General Description

Group Metering Accessories and Renewal Parts, Load-tap connector, For MSR meter sockets

Warranty

Eaton Selling Policy 25-000, one (1) year from the date of installation of the product or eighteen (18) months from the date of shipment of the product, whichever occurs first.

Product Specifications

UL Listed

Package: 1.500 x 4.000 x 5.000 in.

Package Weight: 1.000 lbs.

- Load-tap connector
- MSR meter sockets



Eaton
1000 Eaton Boulevard
Cleveland, OH 44122
United States
Eaton.com

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Sheet Name

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Sheet Size

ANSI B
11" X 17"

Sheet Number

D 1.6

Solar PV Inspection Checklist for REI #ELE- _____ Installer _____
Job Address _____ City/Township _____

Required Documentation

- Manufacturer's specifications for the inverter(s)
- Manufacturer's specifications for the module(s)
- Manufacturer's specifications for the optimizer(s) (if used)
- Verification that the racking system grounding and bonding is listed

PV Inverter

- Is the PV system utility-interactive, stand alone or multimode?
- Is all the equipment listed for PV application or be evaluated for the application and have a field label applied? 690.4
- Is the system solidly grounded, ungrounded, or functionally grounded? 690.2 and 690.41
- Has DC Ground-Fault Protection been provided and properly labeled? 690.41(B)?
- What is the maximum PV system voltage and is the maximum 600 volts or less for a dwelling or 1000 volts or less for non-dwelling or 1500 volts or less when not located on a building? 690.7
- Is all listed equipment and conductors rated for the maximum voltage? 690.7
- Determine the maximum circuit current for the PV Source and Output Circuit; Inverter Output Circuit; Inverter Input Circuit; and DC to DC Converter Output (refer to inverter documentation). 690.8

System Grounding

- Is all exposed non-current carrying metal parts of the PV system grounded? 690.43 and 690.47
- Are the mounting structures or systems used for equipment grounding? 690.43
- Are the interconnecting devices used for equipment grounding listed and identified and are all connections properly torqued? 690.43 and 110.14
- Are the EGC properly sized and protected, if exposed not smaller than #6? 690.45, 250.122, and 250.120(C)
- Has the grounding electrode system been installed? 690.47
- If both are present, has the DC grounding electrode system been bonded to the AC GES? 690.47

Wiring Methods and Disconnecting Means

- Are the conductor and cable ampacities determined at 125% before adjustment factors? 690.8(B)
- How are the PV Source and Output Circuit protected from overcurrent? 690.9
- Do AC or DC OCPD's have the appropriate voltage, current and interrupt ratings? 690.9
- Has arc-fault circuit protection been provided for DC source and/or output circuits? 690.11
- Is a rapid shutdown required and if so, how is it accomplished and identified? 690.12 & 690.56(C)
- Are the PV disconnect permanently marked and installed in a readily accessible location? 690.13
- Are the Isolating devices or equipment disconnecting means installed in circuits connected to equipment at a location within the equipment, or within sight and 10 feet of the equipment? (Where the maximum circuit current is greater than 30 amperes an equipment disconnecting means shall be provided for isolation.) 690.15
- Has the fuse disconnecting means, if required, been installed? 690.15 and 240.40
- Are PV source or output circuits > 30 volts in a raceway or guarded if readily accessible? 690.31
- Is single conductor cable used outdoors sunlight resistant Type USE-2, Type RHW-2, or listed & labeled PV wire, and properly support and secured? 690.31(C)
- Are PV source or output circuits inside a building in a metal raceway and marked? 690.31(D)

Interconnection

- Has a plaque or directory been installed at each disconnecting means (capable of interconnection) denoting all electric power sources & power production sources? 705.10
- Has the point of connection to other sources been installed per 705.11 or 705.12?
- Are the utility interactive inverters connected to the system through a dedicated circuit breaker or fusible disconnecting means? 705.12
- Does the bus or conductor ampacity comply with 705.12?
- Have all the required labels been applied? (See label list.)



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MN CHECKLIST

Sheet Size

ANSI B
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Sheet Number

D 1.7