WYSSLING CONSULTING
CORPORATE EXPERIENCE WITH SMALL BUSINESS VALUE

Scott E. Wyssling, PE
Coleman D. Larsen, SE, PE
Gregory T. Elvestad, PE

76 North Meadowbrook Drive
Alpine, UT 84004
office (201) 874-3483
swyssling@wysslingconsulting.com

July 30, 2024

EnergyOne Renewables
1333 North-West Vivion Road, Suite 101
Kansas City, MO, 64118

Re: Engineering Services
Koschmann Residence
2417 SW River Trail Road, Lee's Summit, MO
6.150 kW System

To Whom It May Concern:

We have received information regarding solar panel installation on the roof of the above referenced structure. Our evaluation of the structure is to verify the existing capacity of the roof system and its ability to support the additional loads imposed by the proposed solar system.

A. Site Assessment Information

1. Site visit documentation identifying attic information including size and spacing of framing for the existing roof structure.
2. Design drawings of the proposed system including a site plan, roof plan and connection details for the solar panels. This information will be utilized for approval and construction of the proposed system.

B. Description of Structure:

Roof Framing:	2x6 dimensional lumber at 16" on center with a purlin support near midspan.
Roof Framing:	2x6 dimensional lumber at 16" on center.
Roof Material:	Composite Asphalt Shingles
Roof Slope:	20 degrees
Attic Access:	Accessible
Foundation:	Permanent

C. Loading Criteria Used

- **Dead Load**
  - Existing Roofing and framing = 7 psf
  - New Solar Panels and Racking = 3 psf
  - TOTAL = 10 PSF
- **Live Load** = 20 psf (reducible) – 0 psf at locations of solar panels
- **Ground Snow Load** = 20 psf
- **Wind Load** based on ASCE 7-16
  - Ultimate Wind Speed = 109 mph (based on Risk Category II)
  - Exposure Category C

Analysis performed of the existing roof structure utilizing the above loading criteria is in accordance with the 2018 International Residential Code, including provisions allowing existing structures to not require strengthening if the new loads do not exceed existing design loads by 105% for gravity elements and 110% for seismic elements. This analysis indicates that the existing framing will support the additional panel loading without damage, if installed correctly.

D. Solar Panel Anchorage

1. The solar panels shall be mounted in accordance with the most recent Sunmodo installation manual. If during solar panel installation, the roof framing members appear unstable or deflect non-uniformly, our office should be notified before proceeding with the installation.
2. The maximum allowable withdrawal force for an M8x115 hex lag bolt is 229 lbs per inch of penetration as identified in the National Design Standards (NDS) of timber construction specifications. Based on a minimum penetration depth of 2½", the allowable capacity per connection is greater than the design withdrawal force (demand). Considering the variable factors for the existing roof framing and installation tolerances, the connection using one M8x115 hex lag bolt with a minimum of 2½" embedment will be adequate and will include a sufficient factor of safety.
3. Considering the wind speed, roof slopes, size and spacing of framing members, and condition of the roof, the panel supports shall be placed no greater than 48" on center.

Based on the above evaluation, this office certifies that with the racking and mounting specified, the existing roof system will adequately support the additional loading imposed by the solar system. This evaluation is in conformance with the 2018 IRC, current industry standards, and is based on information supplied to us at the time of this report.

Should you have any questions regarding the above or if you require further information do not hesitate to contact me.

Very truly yours,

Scott E. Wyssling, PE
Missouri License No. 2019011786
Missouri COA No. 2020037943

Signed 7/30/2024

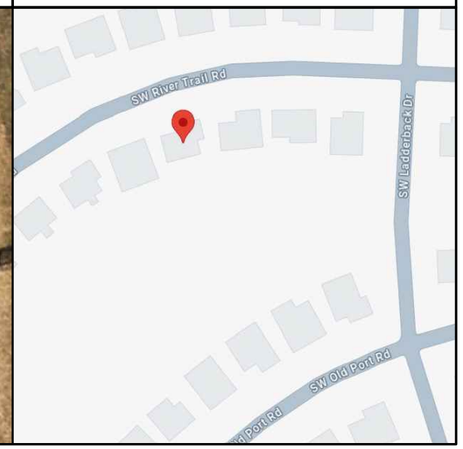
NEW PV SYSTEM DESIGN

15 MODULES - 6.150 kW DC, 5.120 kW AC SYSTEM SIZE

KOSCHMANN RESIDENCE - 2417 SOUTHWEST RIVER TRAIL ROAD, LEE'S SUMMIT, MO 64082

AERIAL MAP
NTS

VICINITY MAP
NTS



GENERAL NOTES

1. CONTRACTOR SHALL FIELD VERIFY ALL DIMENSIONS AND REVIEW ALL MANUFACTURER INSTALLATION DOCUMENTS PRIOR TO INITIATING CONSTRUCTION.
2. ALL COMPONENTS SHALL BE NEW AND LISTED BY A RECOGNIZED ELECTRICAL TESTING LABORATORY AND LISTED FOR THEIR SPECIFIC APPLICATION.
3. OUTDOOR EQUIPMENT SHALL BE NEMA 3R RATED OR BETTER.
4. ACCESS TO ELECTRICAL COMPONENTS OVER 150 VOLTS TO GROUND SHALL BE RESTRICTED TO QUALIFIED PERSONNEL.
5. CONTRACTOR SHALL OBTAIN ELECTRICAL PERMITS PRIOR TO INSTALLATION AND SHALL COORDINATE ALL INSPECTIONS, TESTING COMMISSIONING, AND ACCEPTANCE WITH THE HOMEOWNER, UTILITY CO. AND CITY INSPECTORS AS NEEDED.
6. EACH MODULE TO BE GROUNDED USING THE SUPPLIED CONNECTION POINT PER THE MANUFACTURER'S REQUIREMENTS. ALL PV MODULES, EQUIPMENT, AND METALLIC COMPONENTS ARE TO BE BONDED. IF THE EXISTING GROUNDING ELECTRODE SYSTEM CANNOT BE VERIFIED OR IS ONLY METALLIC WATER PIPING, IT IS THE CONTRACTOR'S RESPONSIBILITY TO INSTALL A SUPPLEMENTAL GROUNDING ELECTRODE.
7. DC CONDUCTORS SHALL BE RUN IN EMT AND/OR MC (METAL CLAD CABLE) AND SHALL BE LABELED. ALL DC CONDUCTORS RUN INSIDE OF THE STRUCTURE SHALL BE INSTALLED A MINIMUM OF 18" BELOW THE ROOF DECK.
8. EXPOSED NON-CURRENT CARRYING METAL PARTS OF ELECTRICAL EQUIPMENT SHALL BE GROUNDED IN ACCORDANCE WITH APPLICABLE NEC.
9. CONFIRM LINE SIDE VOLTAGE AT THE ELECTRIC UTILITY SERVICE PRIOR TO CONNECTING INVERTER. VERIFY SERVICE VOLTAGE IS WITHIN INVERTER VOLTAGE OPERATIONAL RANGE.
10. ELECTRICAL CONTRACTOR TO PROVIDE CONDUIT EXPANSION JOINTS AND ANCHOR CONDUIT RUNS AS REQUIRED PER CODE.
11. ALL WIRING MUST BE PROPERLY SUPPORTED BY DEVICES OR MECHANICAL MEANS DESIGNED AND LISTED FOR SUCH USE, AND FOR ROOF-MOUNTED SYSTEMS, WIRING MUST BE PERMANENTLY AND COMPLETELY HELD OFF OF THE ROOF SURFACE.
12. ALL ROOF PENETRATIONS MUST BE SEALED OR FLASHED.
13. EQUIPMENT MAY BE SUBSTITUTED FOR SIMILAR EQUIPMENT BASED ON AVAILABILITY, SUBSTITUTED EQUIPMENT SHALL COMPLY WITH DESIGN CRITERIA.
14. REMOVAL OF AN INTERACTIVE INVERTER OR OTHER EQUIPMENT SHALL NOT DISCONNECT THE BONDING CONNECTION BETWEEN THE GROUNDING ELECTRODE CONDUCTOR AND THE PHOTOVOLTAIC SOURCE AND/OR OUTPUT CIRCUIT GROUNDED CONDUCTORS.
15. WHENEVER A DISCREPANCY IN THE QUALITY OF EQUIPMENT ARISES ON THE DRAWING OR SPECIFICATIONS, THE CONTRACTOR SHALL BE RESPONSIBLE FOR PROVIDING AND INSTALLING ALL MATERIAL AND SERVICES REQUIRED BY THE STRICTEST CONDITIONS NOTED ON THE DRAWINGS OR IN THE SPECIFICATIONS TO ENSURE COMPLETE COMPLIANCE AND LONGEVITY OF THE OPERABLE SYSTEM REQUIRED BY THE ENGINEERS.

SHEET INDEX

SCOPE OF WORK

SYSTEM SIZE: 6.150kW DC / 5.120kW AC SYSTEM SIZE
PV MODULE: (15) MSOLAR 410 108BB
INVERTER: (8) AP DS 3-S
COMBINER: (1) 125A LOAD CENTER
AC DISCONNECT: (1) 60A FUSED AC DISCONNECT
PV PRODUCTION METER: (1) 200A PV PRODUCTION METER

ROOF STORIES: 2
ROOF TYPE(S): COMP SHINGLE
MOUNTING(S) & RACKING(S): (39) SUNMODO NANOMOUNTS (ROOF MOUNT) WITH SMR 100 RAIL

INTERCONNECTION: LINE SIDE TAP
MAIN SERVICE PANEL RATING: (E) 200A
MAIN BREAKER RATING: (E) 200A

GOVERNING CODES

2017 NATIONAL ELECTRIC CODE
2018 INTERNATIONAL BUILDING CODE
2018 INTERNATIONAL RESIDENTIAL CODE
2018 INTERNATIONAL FIRE CODE
2018 INTERNATIONAL FUEL GAS CODE
2018 INTERNATIONAL EXISTING BUILDING CODE
2018 INTERNATIONAL ENERGY CONSERVATION CODE
2018 INTERNATIONAL MECHANICAL CODE
2018 INTERNATIONAL PLUMBING CODE

AS ADOPTED BY LEE'S SUMMIT INCLUDING ANY AMENDMENTS OR ADDITIONAL LISTED REQUIREMENTS. DESIGNED IN ACCORDANCE WITH THE REQUIREMENTS OF EVERGY UTILITY.

RELEASE FOR CONSTRUCTION
AS NOTED ON PLANS REVIEW
DEVELOPMENT SERVICES
LEE'S SUMMIT, MISSOURI
08/12/2024 4:58:15

Andrea Sessler
Digitally signed by Andrea Sessler
DN: CN=Andrea Sessler, OU=Development, OU=LS Users, DC=COLS, DC=LOC
Date: 2024.08.12 16:58:49-05'00'

DESIGN CRITERIA

WIND SPEED: 109 MPH
GROUND SNOW LOAD: 20 PSF
ASCE: 7-16
EXPOSURE CATEGORY: C
BUILDING OCCUPANCY: R-2
CONSTRUCTION TYPE: TYPE I-B
SPRINKLERS: NO

DATE	REVISION

DESIGN ENGINEER

WYSSLING CONSULTING
CORPORATE EXPERIENCE WITH SMALL BUSINESS VALUE

76 N. MEADOWBROOK DRIVE
ALPINE UT 84004
swyssling@wysslingconsulting.com
(201) 874-3483
COA NO. 2020037943

SOLAR COMPANY/CLIENT

EnergyONE Renewables

ENERGYONE
1333 NW VIVION RD STE 101
KANSAS CITY, MO

KOSCHMANN RESIDENCE
2417 SOUTHWEST RIVER TRAIL ROAD
LEE'S SUMMIT, MO 64082

COVER PAGE

STATE OF MISSOURI
SCOTT E WYSSLING
NUMBER PE-2019011786
PROFESSIONAL ENGINEER

Signed 7/30/2024

SCOTT E WYSSLING, PE
MO LICENSE NO 2019011786

DC SYSTEM SIZE: 6.150kW
AC SYSTEM SIZE: 5.120kW

PV-1

AHJ: LEE'S SUMMIT
UTILITY: EVERGY

DRAWN BY: MAS
DATE: 07/30/2024

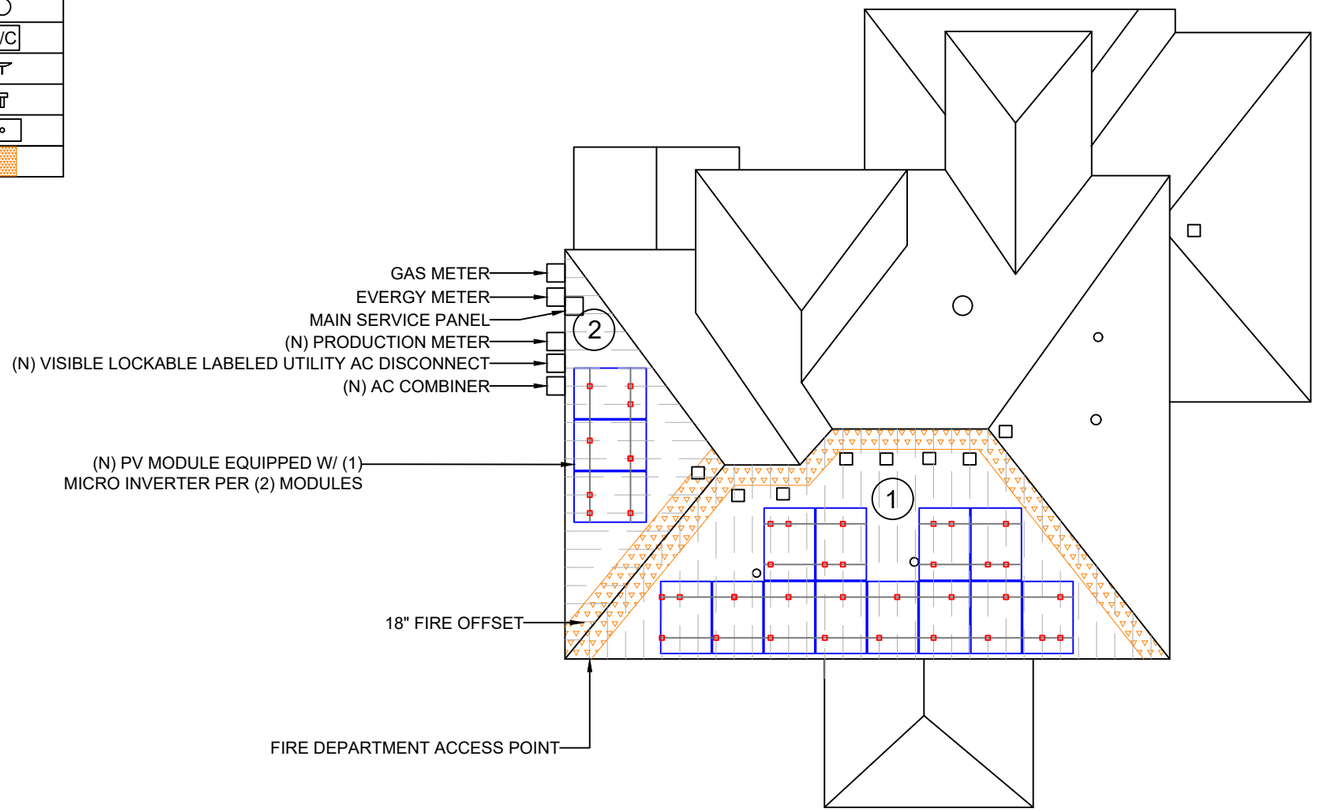
SYSTEM INFORMATION	
MODULE TYPE	MSolar 410 108BB
MODULE WEIGHT	46.3 LBS
MODULE DIMENSIONS	67.80" x 44.65"
UNIT WEIGHT OF ARRAY	2.20 PSF

LEGEND	
ROOF VENT (TYP.)	
PLUMBING VENT (TYP.)	
A/C UNIT	A/C
SATELLITE DISH	
ELECTRICAL MAST	
CHIMNEY	
FIRECODE PATHWAY	

ROOF DESCRIPTION

ROOF #	ROOF TYPE	TILT	AZIMUTH	ROOF FRAMING	MODULE COUNT	ARRAY SQ. FT.	ATTACHMENT	MIN EMBEDMENT
1	COMP SHINGLE	20°	165°	2X6@16" O.C. RAFTERS	12	252.23	(1) M8X115 LAG SCREW	2.5"
2	COMP SHINGLE	20°	255°	2X6@16" O.C. RAFTERS	3	63.06	(1) M8X115 LAG SCREW	2.5"
TOTAL ROOF AREA SQ. FT.		2334.31		TOTAL ARRAY SQ. FT.		315.29	ROOF COVER %	13.51

2417 SOUTHWEST RIVER TRAIL ROAD

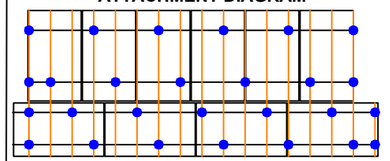


SITE PLAN NOTES

1. ALL OBSTRUCTIONS MUST BE VERIFIED BEFORE WORK COMMENCES
2. CONDUIT TO BE RUN IN ATTIC IF POSSIBLE
3. VISIBLE LOCKABLE LABELED UTILITY AC DISCONNECT WILL BE INSTALLED WITHIN 10' OF EVERGY METER.
4. AC DISCONNECT SHALL BE READILY ACCESSIBLE 24/7
5. REQUIRED ELECTRICAL CLEARANCE TO BE MAINTAINED

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

ATTACHMENT DIAGRAM



1. MAX ATTACHMENT SPACING SHALL NOT EXCEED 48" O.C
2. ATTACHMENTS SHALL BE STAGGERED
3. ROOF SPACING: 16" O.C.
4. MAX CANTILEVERS < 24"
5. ATTACHED TO ROOF FRAMING

DESIGN ENGINEER

WYSSLING CONSULTING
CORPORATE EXPERIENCE WITH SMALL BUSINESS VALUE

76 N. MEADOWBROOK DRIVE
ALPINE UT 84004
swyssling@wysslingconsulting.com
(201) 874-3483
COA NO. 2020037943

SOLAR COMPANY/CLIENT

EnergyONE Renewables

ENERGYONE
1333 NW VIVION RD STE 101
KANSAS CITY, MO

KOSCHMANN RESIDENCE
2417 SOUTHWEST RIVER TRAIL ROAD
LEE'S SUMMIT, MO 64082

SITE PLAN

Signed 7/30/2024

SCOTT E WYSSLING, PE
MO LICENSE NO 2019011786

DC SYSTEM SIZE: 6.150kW
AC SYSTEM SIZE: 5.120kW

PV-2

AHJ: LEE'S SUMMIT
UTILITY: EVERGY

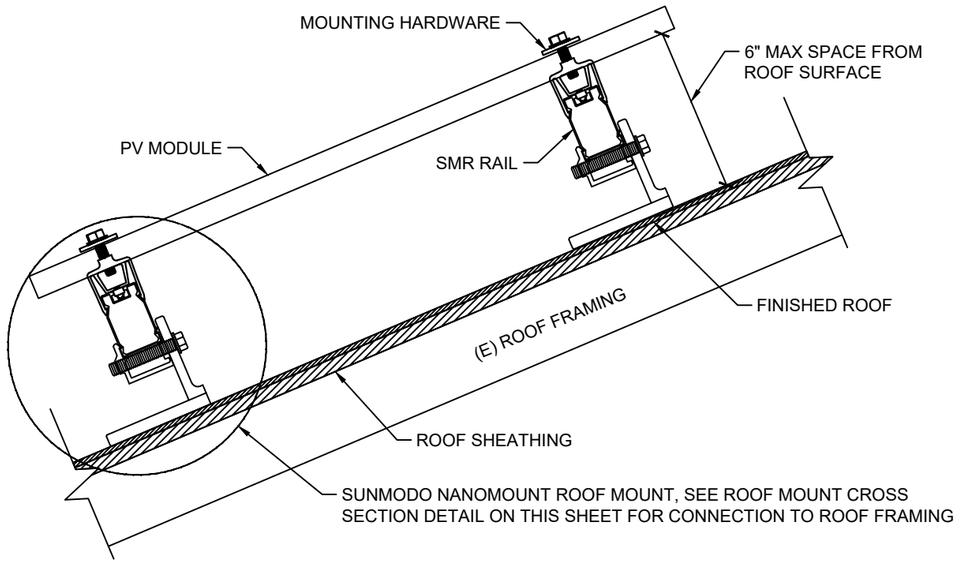
DRAWN BY: MAS
DATE: 07/30/2024

RELEASE FOR CONSTRUCTION
AS NOTED ON PLANS REVIEW
DEVELOPMENT SERVICES
LEE'S SUMMIT, MISSOURI
08/12/2024 4:58:15

MOUNTING INFORMATION	
ROOF SECTIONS	R1, R2

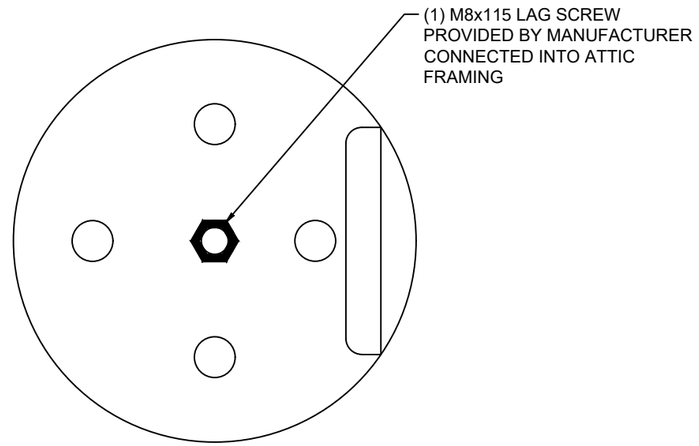
GENERAL ROOF MOUNT DETAIL

NTS



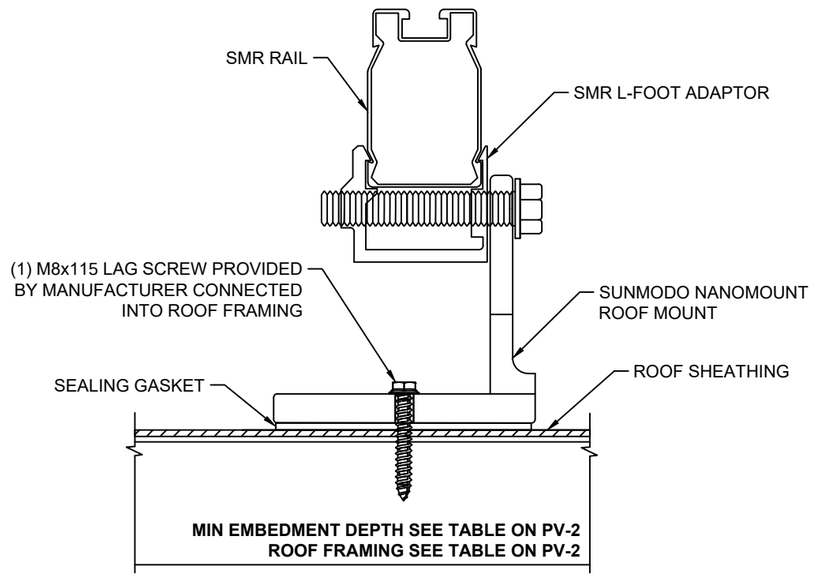
ROOF MOUNT PLAN VIEW DETAIL

NTS



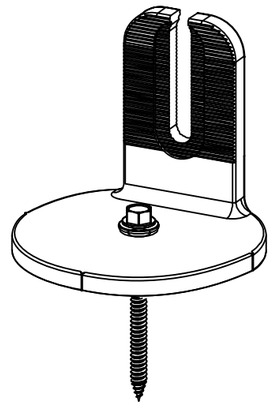
ROOF MOUNT CROSS SECTION DETAIL

NTS



ROOF MOUNT

NTS



DESIGN ENGINEER

WYSSLING CONSULTING
CORPORATE EXPERIENCE WITH SMALL BUSINESS VALUE

76 N. MEADOWBROOK DRIVE
ALPINE UT 84004
swyssling@wysslingconsulting.com
(201) 874-3483
COA NO. 2020037943

SOLAR COMPANY/CLIENT

EnergyONE Renewables

ENERGYONE
1333 NW VIVION RD STE 101
KANSAS CITY, MO

KOSCHMANN RESIDENCE
2417 SOUTHWEST RIVER TRAIL ROAD
LEE'S SUMMIT, MO 64082

MOUNTING DETAILS

STATE OF MISSOURI
SCOTT E WYSSLING
NUMBER PE-2019011786
PROFESSIONAL ENGINEER

Signed 7/30/2024

SCOTT E WYSSLING, PE
MO LICENSE NO 2019011786

DC SYSTEM SIZE: 6.150kW
AC SYSTEM SIZE: 5.120kW

PV-3

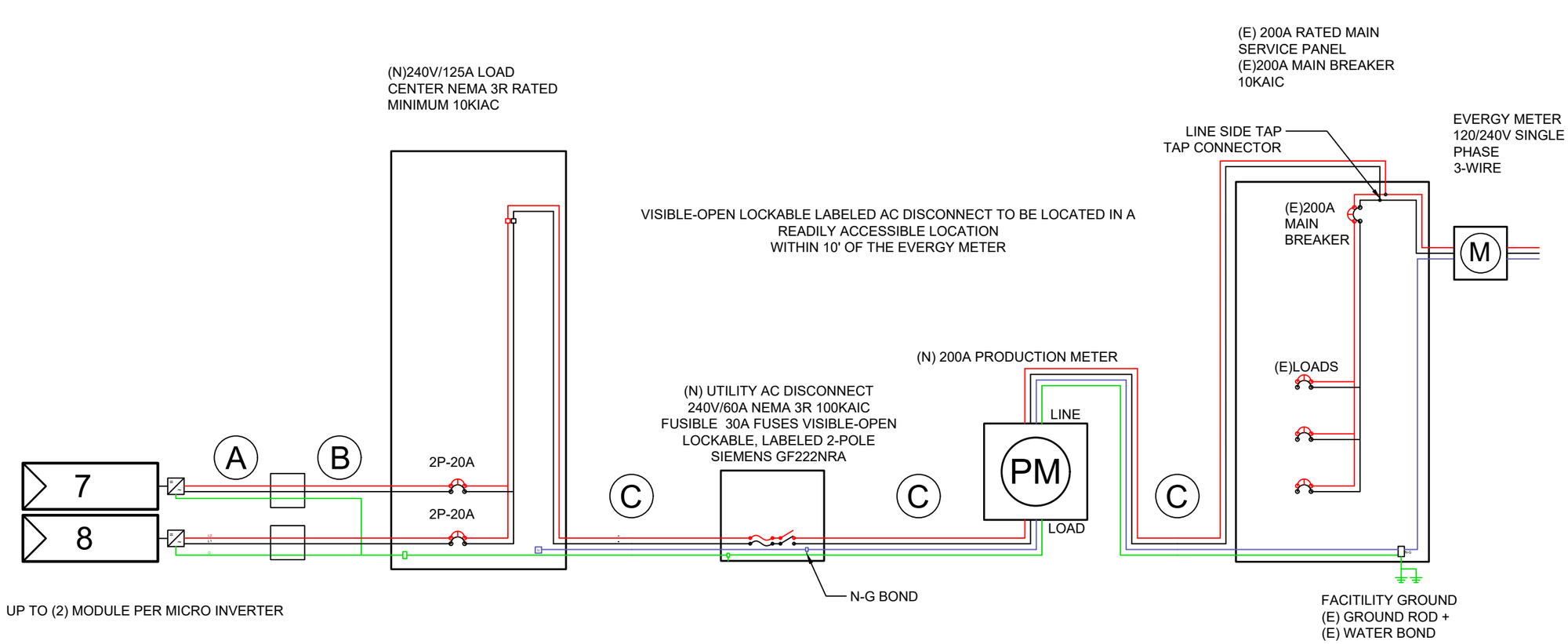
AHJ:	LEE'S SUMMIT
UTILITY:	EVERGY
DRAWN BY:	MAS
DATE:	07/30/2024

RELEASE FOR CONSTRUCTION
AS NOTED ON PLANS REVIEW
DEVELOPMENT SERVICES
LEE'S SUMMIT, MISSOURI
08/12/2024 4:58:15

MODULE TYPE: (15) MSOLAR 410 108BB 240V
INVERTER TYPE: (8) AP DS 3-S 240V

CONDUCTOR SCHEDULE

TAG	# WIRES IN CONDUIT	MINIMUM WIRE SIZE	TYPE, MATERIAL	MINIMUM GROUND WIRE SIZE	GROUND TYPE,MATERIAL	CONDUIT	AMPS (BEFORE 125% SAFETY FACTOR)	TOTAL AMPS	WIRE AMPERAGE RATING TABLE 310.15(B)(16)	MINIMUM OCPD
A	3	#10 AWG	THWN-2, CU	#6 AWG	BARE CU	3/4 EMT	10.64	13.3	30	20
B	3	#10 AWG	THWN-2, CU	#12 AWG	THWN-2, CU	3/4 EMT	10.64	13.3	30	20
C	4	#6 AWG	THWN-2, CU	#10 AWG	THWN-2, CU	3/4 EMT	21.28	26.6	65	30



DESIGN ENGINEER

WYSSLING CONSULTING
CORPORATE EXPERIENCE WITH SMALL BUSINESS VALUE

76 N. MEADOWBROOK DRIVE
ALPINE UT 84004
swyssling@wysslingconsulting.com
(201) 874-3483
COA NO. 2020037943

SOLAR COMPANY/CLIENT

EnergyONE Renewables

ENERGYONE
1333 NW VIVION RD STE 101
KANSAS CITY, MO

KOSCHMANN RESIDENCE
2417 SOUTHWEST RIVER TRAIL ROAD
LEE'S SUMMIT, MO 64082

THREE LINE DIAGRAM

DC SYSTEM SIZE: 6.150kW
AC SYSTEM SIZE: 5.120kW

PV-4

AHJ: LEE'S SUMMIT
UTILITY: EVERGY

DRAWN BY: MAS
DATE: 07/30/2024

PV MODULE		INVERTER	
MODEL	MSOLAR 410 108BB	MODEL	AP DS 3-S
PMAX	410W	MAX INPUT DC VOLTAGE	60V
VOC	35.23V	MAX DC CURRENT	16A
VMP	31.45V	MAX OUTPUT POWER	640W
IMP	13.04A	MAXIMUM CONT. OUTPUT CURRENT	2.66A
ISC	13.95A	CEC EFFICIENCY	0.97

INTERCONNECTION PER NEC 705.12 (B)	
BACK FEED REQUIRED	26.6A
MINIMUM FUSE RATING	30A

GENERAL ELECTRICAL NOTES

1. CONDUIT A AND B AMPS EQUAL TO LARGEST STRING ON TAG.
2. CONDUIT A SHALL BE RUN THROUGH ATTIC IF POSSIBLE.
3. EQUIPMENT MAY BE SUBSTITUTED FOR SIMILAR EQUIPMENT BASED ON AVAILABILITY, SUBSTITUTED EQUIPMENT SHALL COMPLY WITH DESIGN CRITERIA. WIRE SIZES ARE BASED ON MINIMUMS AND ARE NOT MEANT TO LIMIT UPSIZING AS REQUIRED BY FIELD CONDITIONS/AVAILABILITY.
4. WIRING SHALL COMPLY WITH MAXIMUM CONTINUOUS CURRENT OUTPUT AT 25°C AND MAXIMUM VOLTAGE AT 600V; WIRE SHALL BE WET RATED AT 90°C.
5. EXPOSED PHOTOVOLTAIC SYSTEM CONDUCTORS ON THE ROOF WILL BE TYPE 2 OR PV-TYPE WIRE.
6. PHOTOVOLTAIC SYSTEM CONDUCTORS SHALL BE IDENTIFIED AND GROUPED. THE MEANS OF IDENTIFICATION SHALL BE PERMITTED BY SEPARATE COLOR-CODING, MARKING TAPE, TAGGING OR OTHER APPROVED MEANS.
7. ALL CONDUCTORS AND TERMINATIONS SHALL BE RATED FOR INSTALL LOCATION
8. ALL EXTERIOR CONDUIT, FITTINGS, AND BOXES SHALL BE RAIN-TIGHT AND APPROVED FOR USE IN WET LOCATIONS.
9. ALL METALLIC RACEWAYS AND EQUIPMENT SHALL BE BONDED AND ELECTRICALLY CONTINUOUS.
10. WHERE SIZES OF JUNCTION BOXES, RACEWAYS, AND CONDUITS ARE NOT SPECIFIED, CONTRACTOR SHALL SIZE THEM ACCORDING TO APPLICABLE CODES.
11. REMOVAL OF A UTILITY-INTERACTIVE INVERTER OR OTHER EQUIPMENT SHALL NOT DISCONNECT THE BUILDING CONNECTION BETWEEN THE GROUNDING ELECTRODE CONDUCTOR AND THE PV SOURCE AND/OR OUTPUT CIRCUIT GROUNDED CONDUCTOR.
12. FOR GROUNDED SYSTEMS, THE PHOTOVOLTAIC SOURCE AND OUTPUT CIRCUITS SHALL BE PROVIDED WITH A GROUND-FAULT PROTECTION DEVICE OR SYSTEM THAT DETECTS A GROUND FAULT, INDICATES THAT FAULT HAS OCCURRED, AND AUTOMATICALLY DISCONNECTS ALL CONDUCTORS OR CAUSES THE INVERTER TO AUTOMATICALLY CEASE SUPPLYING POWER TO OUTPUT CIRCUITS.
13. FOR UNGROUNDED SYSTEMS, THE INVERTER IS EQUIPPED WITH GROUND FAULT PROTECTION AND A GFI FUSE PORT FOR GROUND FAULT INDICATION.
14. PV MODULE FRAMES SHALL BE BONDED TO RACKING RAIL OR BARE COPPER GEC/GEC PER THE MODULE MANUFACTURER'S LISTED INSTRUCTION SHEET.
15. PV MODULE RACKING RAIL SHALL BE BONDED TO BARE COPPER GEC VIA WEEB LUG, IL SCO GBL-4DBT LAY IN LUG, OR EQUIVALENT LISTED LUG.
16. THE PHOTOVOLTAIC INVERTER WILL BE LISTED AS AUL 1741 COMPLIANT.
17. RACKING AND BONDING SYSTEM TO BE UL2703 RATED.
18. ANY REQUIRED GROUNDING ELECTRODE CONDUCTOR WILL BE CONTINUOUS, EXCEPT FOR SPLICES OR JOINTS AS BUSBARS WITHIN LISTED EQUIPMENT
19. WHEN BACKFEED BREAKER IS THE METHOD OF UTILITY INTERCONNECTION, THE BREAKERS SHALL NOT READ "LINE AND LOAD."
20. WHEN APPLYING THE 120% RULE, THE SOLAR BREAKER TO BE POSITIONED AT THE OPPOSITE END OF THE BUSBAR FROM THE MAIN BREAKER.
21. THE WORKING CLEARANCE AROUND THE EXISTING ELECTRICAL EQUIPMENT AS WELL AS THE NEW ELECTRICAL EQUIPMENT WILL BE MAINTAINED.
22. LISTED CONDUIT AND CONDUCTOR SIZES ARE BASED ON MINIMUM CODE REQUIREMENTS AND ARE NOT MEANT TO LIMIT UPSIZING AS REQUIRED BY FIELD CONDITIONS/AVAILABILITY.
23. AP DS 3-S INVERTERS HAVE INTEGRATED GROUND AND DOUBLE INSULATION. NO GEG OR EGC IS REQUIRED. THE DC CIRCUIT IS ISOLATED AND INSULATED FROM GROUND AND MEETS THE REQUIREMENTS OF NEC.
24. CALCULATIONS ARE BASED ON A) ASHRAE 2# AVERAGE HIGH = 32°C B)NEC TABLE 310.15(B)2(a) 75° DERATE FACTOR = .96 C) NEC TABLE NEC 310.15(B)(16) 75°C.
25. SUPPLEMENTAL GROUNDING ELECTRODE TO BE INSTALLED NO CLOSER THAN 6' FROM EXISTING WHEN REQUIRED. NEC 250.53(A)(2) DOES NOT REQUIRE IT IF CONTRACTOR CAN PROVE THAT A SINGLE ROD HAS A RESISTANCE TO EARTH OF 25 OHMS OR LESS.

DESIGN ENGINEER

WYSSLING CONSULTING
CORPORATE EXPERIENCE WITH SMALL BUSINESS VALUE

76 N. MEADOWBROOK DRIVE
ALPINE UT 84004
swyssling@wysslingconsulting.com
(201) 874-3483
COA NO. 2020037943

SOLAR COMPANY/CLIENT

EnergyONE Renewables

ENERGYONE
1333 NW VIVION RD STE 101
KANSAS CITY, MO

KOSCHMANN RESIDENCE
2417 SOUTHWEST RIVER TRAIL ROAD
LEE'S SUMMIT, MO 64082

ELECTRICAL NOTES

DC SYSTEM SIZE: 6.150kW
AC SYSTEM SIZE: 5.120kW

PV-5

AHJ: LEE'S SUMMIT
UTILITY: EVERGY

DRAWN BY: MAS
DATE: 07/30/2024

PHOTOVOLTAIC AC DISCONNECT
MAXIMUM AC OPERATING CURRENT: 21.28
NOMINAL OPERATING AC VOLTAGE: 240

AT POINT OF INTERCONNECTION, MARKED AT DISCONNECTING MEANS [NEC 690.54]

⚠WARNING DUAL POWER SOURCE
SECOND SOURCE IS PHTOVOLTAIC SYSTEM

AT POINT OF INTERCONNECTION [NEC 705.12(C),690.59]

MAIN PHOTOVOLTAIC SYSTEM DISCONNECT

EACH PV SYSTEM DISCONNECTING MEANS SHALL PLAINLY INDICATE WHETHER IN THE OPEN (OFF) OR CLOSED (ON) POSITION AND BE PERMANENTLY MARKED [NEC 690.13(B)]

PHOTOVOLTAIC
DC DISCONNECT

AT EACH DC DISCONNECTING MEANS [NEC 690.13(B)]

PHOTOVOLTAIC
AC DISCONNECT

AT EACH AC DISCONNECTING MEANS [NEC 690.13(B)]

WARNING: PHOTOVOLTAIC POWER SOURCE

AT EXPOSED RACEWAYS, CABLE TRAYS, AND OTHER WIRING METHODS; SPACED AT MAXIMUM 10 FT SECTION OR WHERE SEPARATED BY ENCLOSURES, WALLS, PARTITIONS, CEILINGS, OR FLOORS [NEC 690.31(D)(2)]

⚠WARNING
ELECTRICAL SHOCK HAZARD
DO NO TOUCH TERMINALS
TERMINALS ON BOTH LINE AND LOAD SIDES
MAY BE ENERGIZED IN THE OPEN POSITION

AT BUILDING OR STRUCTURE MAIN DISCONNECTING MEANS [NEC 690.12(E), NEC 690.13(B)]

⚠ WARNING
PHOTOVOLTAIC SYSTEM
COMBINER PANEL
DO NOT ADD LOADS

AT AC COMBINER PANEL [NEC 690.13(B)]

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

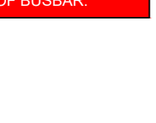
PERMANENT WARNING LABELS SHALL BE APPLIED TO DISTRIBUTION EQUIPMENT

⚠WARNING
INVERTER OUTPUT CONNECTION. DO NOT RELOCATE THIS OVERCURRENT DEVICE

A PERMANENT WARNING LABEL SHALL BE APPLIED TO THE DISTRIBUTION EQUIPMENT ADJACENT TO THE BACK-FED BREAKER FROM THE INVERTER [NEC 705.12(B)(3)(2)]

SOLAR PV SYSTEM EQUIPPED WITH RAPID SHUTDOWN

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



FOR PV SYSTEMS THAT SHUT DOWN THE ARRAY AND CONDUCTORS LEAVING THE ARRAY: THE TITLE "SOLAR PV SYSTEM IS EQUIPPED WITH RAPID SHUTDOWN" SHALL UTILIZED CAPITALIZED CHARACTERS WITH A MINIMUM HEIGHT OF 3/8 IN. IN BLACK ON YELLOW BACKGROUND, AND THE REMAINING CHARACTERS SHALL BE CAPITALIZED WITH A MINIMUM HEIGHT OF 3/16 IN. IN BLACK ON WHITE BACKGROUND [NEC 690.56(C)(1)(A)]

RAPID SHUTDOWN SWITCH FOR SOLAR PV

A RAPID SHUTDOWN SWITCH SHALL HAVE A LABELED LOCATED ON OR NO MORE THAN 8 FT FROM THE SWITCH THAT INCLUDES THIS WORDING. THE LABEL SHALL BE REFLECTIVE, WITH ALL LETTERS CAPITALIZED AND HAVING A MINIMUM HEIGHT OF 3/8 IN., IN WHITE ON RED BACKGROUND [NEC 690.58(C)(2)]

CAUTION: DO NOT INSTALL ADDITIONAL LOADS IN THIS PANEL

PLACE LABEL AT MAIN SERVICE PANEL

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

PLACE LABEL AT MAIN SERVICE PANEL

LABELING NOTES:

1. LABELS CALLED OUT ACCORDING TO ALL COMMON CONFIGURATIONS. ELECTRICIAN TO DETERMINE EXACT REQUIREMENTS IN THE FIELD PER CURRENT NEC AND LOCAL CODES AND MAKE APPROPRIATE ADJUSTMENTS.
2. LABELING REQUIREMENTS BASED ON THE NATIONAL ELECTRIC CODE, OSHA STANDARD 19010.145, ANSI Z535.
3. MATERIAL BASED ON THE REQUIREMENTS OF THE AUTHORITY HAVING JURISDICTION.
4. LABELS TO BE OF SUFFICIENT DURABILITY TO WITHSTAND THE ENVIRONMENT INVOLVED [NEC 110.21] THEY SHALL BE PERMANENTLY ATTACHED, WEATHER/SUNLIGHT RESISTANT, AND SHALL NOT BE HAND WRITTEN PER NEC 110.21(B)
5. APPLICABLE LABELS TO BE A MINIMUM LETTER HEIGHT OF 3/8", WHITE ON RED BACKGROUND; REFLECTIVE, AND PERMANENTLY AFFIXED [IFC 605.11.1.1]

DESIGN ENGINEER

WYSSLING CONSULTING
CORPORATE EXPERIENCE WITH SMALL BUSINESS VALUE

76 N. MEADOWBROOK DRIVE
ALPINE UT 84004
swyssling@wysslingconsulting.com
(201) 874-3483
COA NO. 2020037943

SOLAR COMPANY/CLIENT

EnergyONE Renewables

ENERGYONE
1333 NW VIVION RD STE 101
KANSAS CITY, MO

KOSCHMANN RESIDENCE
2417 SOUTHWEST RIVER TRAIL ROAD
LEE'S SUMMIT, MO 64082

LABELS

DC SYSTEM SIZE: 6.150kW
AC SYSTEM SIZE: 5.120kW

PV-6

AHJ: LEE'S SUMMIT
UTILITY: EVERGY

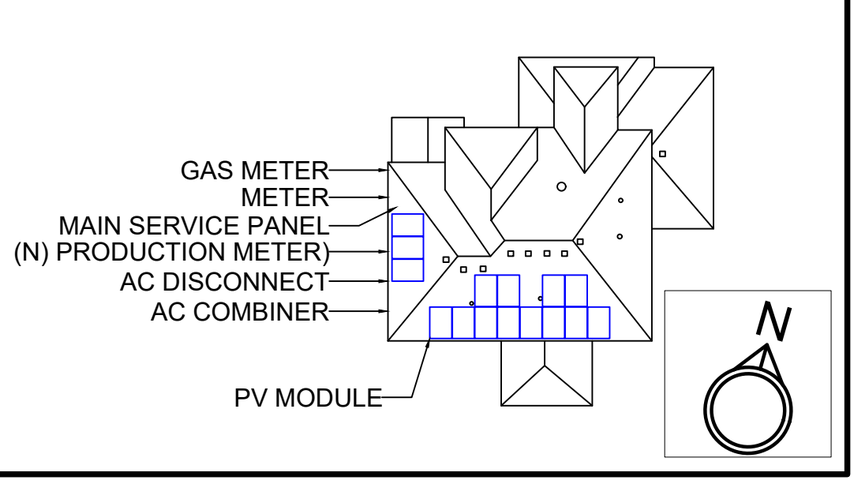
DRAWN BY: MAS
DATE: 07/30/2024

RELEASE FOR CONSTRUCTION
AS NOTED ON PLANS REVIEW
DEVELOPMENT SERVICES
LEE'S SUMMIT, MISSOURI
08/12/2024 4:58:16

CAUTION

POWER TO THIS BUILDING IS ALSO SUPPLIED FROM THE FOLLOWING SOURCES WITH DISCONNECTS AS SHOWN

2417 SOUTHWEST RIVER TRAIL ROAD LEE'S SUMMIT,MO 64082



LOCATION: MSP
NEC 705.10

DESIGN ENGINEER

WYSSLING CONSULTING
CORPORATE EXPERIENCE WITH SMALL BUSINESS VALUE

76 N. MEADOWBROOK DRIVE
ALPINE UT 84004
swyssling@wysslingconsulting.com
(201) 874-3483
COA NO. 2020037943

SOLAR COMPANY/CLIENT

EnergyONE Renewables

ENERGYONE
1333 NW VIVION RD STE 101
KANSAS CITY, MO

KOSCHMANN RESIDENCE
2417 SOUTHWEST RIVER TRAIL ROAD
LEE'S SUMMIT, MO 64082

PLACARD

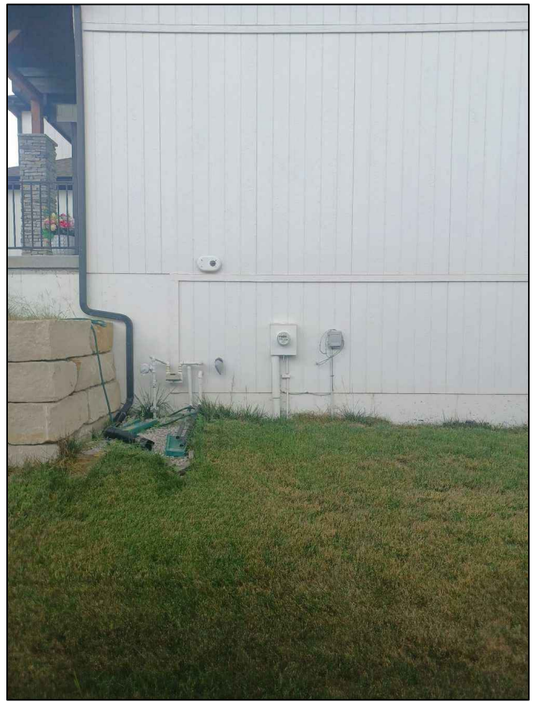
DC SYSTEM SIZE: 6.150kW
AC SYSTEM SIZE: 5.120kW

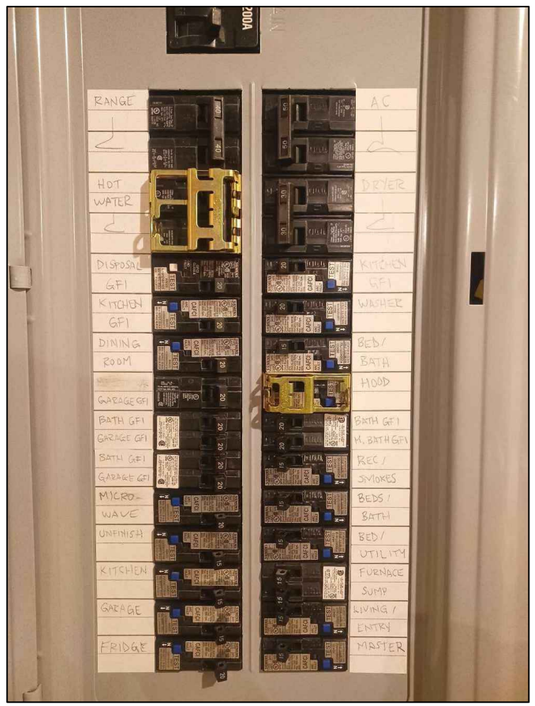
PV-6.1

AHJ: LEE'S SUMMIT
UTILITY: EVERGY

DRAWN BY: MAS
DATE: 07/30/2024

RELEASE FOR CONSTRUCTION
AS NOTED ON PLANS REVIEW
DEVELOPMENT SERVICES
LEE'S SUMMIT, MISSOURI
08/12/2024 4:58:16





DESIGN ENGINEER

WYSSLING CONSULTING
CORPORATE EXPERIENCE WITH SMALL BUSINESS VALUE

76 N. MEADOWBROOK DRIVE
ALPINE UT 84004
swyssling@wysslingconsulting.com
(201) 874-3483
COA NO. 2020037943

SOLAR COMPANY/CLIENT

EnergyONE Renewables

ENERGYONE
1333 NW VIVION RD STE 101
KANSAS CITY, MO

KOSCHMANN RESIDENCE
2417 SOUTHWEST RIVER TRAIL ROAD
LEE'S SUMMIT, MO 64082

SITE PHOTOS

DC SYSTEM SIZE: 6.150kW
AC SYSTEM SIZE: 5.120kW

PV-7

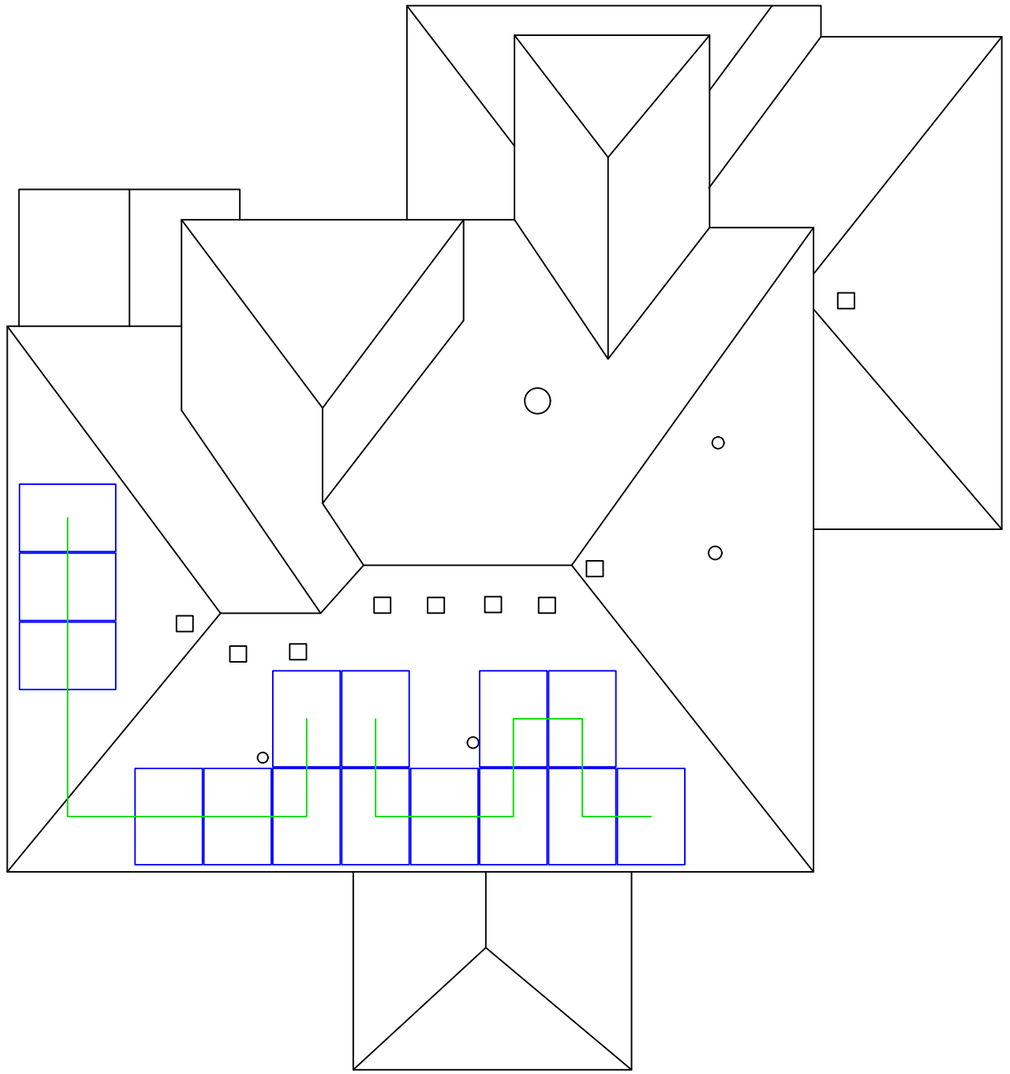
AHJ: LEE'S SUMMIT
UTILITY: EVERGY

DRAWN BY: MAS
DATE: 07/30/2024

2 STRINGS OF MODULES

MODULE: (15) MSOLAR 410 108BB
INVERTER: (8) AP DS 3-S
COMBINER: (1) 125A LOAD CENTER

STRING 1: (8) MODULES
STRING 2: (7) MODULES



DESIGN ENGINEER

WYSSLING CONSULTING
CORPORATE EXPERIENCE WITH SMALL BUSINESS VALUE

76 N. MEADOWBROOK DRIVE
ALPINE UT 84004
swyssling@wysslingconsulting.com
(201) 874-3483
COA NO. 2020037943

SOLAR COMPANY/CLIENT

EnergyONE Renewables

ENERGYONE
1333 NW VIVION RD STE 101
KANSAS CITY, MO

KOSCHMANN
RESIDENCE
2417 SOUTHWEST RIVER TRAIL ROAD
LEE'S SUMMIT, MO 64082

STRING PLAN

DC SYSTEM SIZE: 6.150kW
AC SYSTEM SIZE: 5.120kW

PV-8

AHJ: LEE'S SUMMIT
UTILITY: EVERGY

DRAWN BY: MAS
DATE: 07/30/2024

msolar

108BB 410W HC Series

mSolar 10BB Half-Cell Black
Monocrystalline PERC PV Module

Excellent efficiency
10 busbar technology increases power by decreasing the distance between busbars and the finger grid line

Improved weak illumination response
More power output even in lower light conditions such as overcast days or off-peak sunlight hours

Anti PID
Panels rigorously tested to limit power degradation caused by 'stray' currents

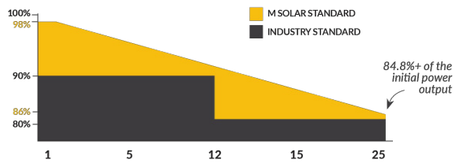
High wind and snow resistance
5,400Pa Snow Load
2,400Pa Wind Load

25-year warranty
M Solar modules are guaranteed to retain at least 84.3% of the initial power output

Appealing Aesthetics
Fully black module creates a sleek, uniform array

25-year product warranty, 25-year output warranty

0.5% annual degradation over 25 years



CEC

UL 61730 | IEC 61215 | IEC 61730
ISO9001, ISO14001, ISO45001

www.msolarenergy.us

108BB 410W HC Series | **msolar 10BB** Half-Cell, All-Black Monocrystalline PERC PV Module

Electrical Characteristics | STC*

Module Type	TXI10-400108BB	TXI10-405108BB	TXI10-410108BB
Nominal Power Watt Pmax (W)*	400	405	410
Power Output Tolerance Pmax (W)	0~+5	0~+5	0~+5
Maximum Power Voltage Vmp (V)	31.01	31.21	31.45
Maximum Power Current Imp (A)	12.90	12.98	13.04
Open Circuit Voltage (V)	37.07	37.23	37.32
Short Circuit Current Isc (A)	13.97	13.87	13.95
Module Efficiency (%)	20.48	20.74	21.00

*STC (Standard Test Condition): Irradiance 1000W/m², Module Temperature 25°C, AM 1.5
*Measuring tolerance: ±

Electrical Characteristics | NMOT*

Maximum Power Watt Pmax (Wp)	270	274	278
Maximum Power Voltage Vmpp (V)	29.26	29.47	29.72
Maximum Power Current Impp (A)	10.32	10.38	10.43
Open Circuit Voltage Voc (V)	34.88	35.12	35.23
Short Circuit Current Isc (A)	11.03	11.10	11.16

*NMOT(Nominal module operating temperature): Irradiance 800W/m², Ambient Temperature 20°C, AM 1.5, Wind Speed 1m/s

Mechanical Data

Solar Cells	Mono PERC, 182mm half cells
Cells orientation	108 (6x9+6x9)
Module dimension	67.80x44.65x1.38 in. (1,722x1,134x35 mm)
Weight	46.30 lb (21.00 kg)
Glass	3.2mm, High Transmission, Low Iron & Semi-Tempered Glass
Junction Box	IP 68, 3 Diodes
Cables	1,200mm
Connectors	MC4 EVO2

Temperature Ratings

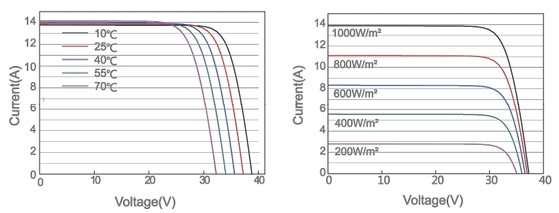
NOCT	42°C±2°C
Temperature coefficient of Pmax	-0.350%/°C
Temperature coefficient of Voc	-0.275%/°C
Temperature coefficient of Isc	+0.045%/°C

Working Conditions

Maximum System Voltage	1500VDC
Operating Temperature	-40°C ~+85°C
Maximum Series Fuse	25A
Maximum Load (Snow/Wind)	5,400Pa / 2,400Pa
Fire Rating	UL Type 1**

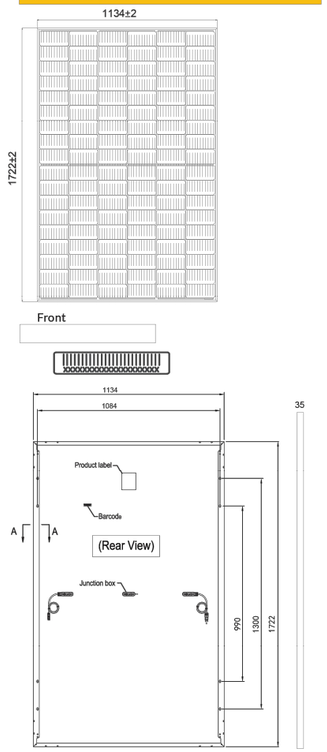
*Do not connect Fuse in Combiner Box with two or more strings in parallel connection
*Remark: Electrical data in this catalog do not refer to a single module and they are not part of the offer. They only serve for comparison among different module types.
**Please note, the 'Fire Class' Rating is designated for the full installed PV system, which includes, but is not limited to, the module, the type of mounting used, pitch and roof composition.

I-V Curves of PV Module (405W)

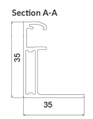


Note: please read safety and installation instructions before using this product. Subject to change without prior notice.

Dimensions (MM)



Tolerance:
Length: ±2mm
Width: ±2mm
Height: ±1mm
Pitch-row: ±1mm



Packaging Details

31 Panels per pallet	Pallet Stack Weight 2,934 lbs. (1341.98 kg)	Truck Weight 38,461.2 lbs. (17,445.7 kg)
26 Pallets per truck		

msolar

DESIGN ENGINEER

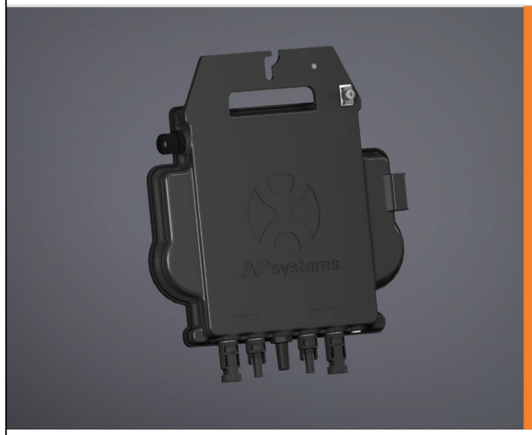
WYSSLING CONSULTING
CORPORATE EXPERIENCE WITH SMALL BUSINESS VALUE

76 N. MEADOWBROOK DRIVE
ALPINE UT 84004
swyssling@wysslingconsulting.com
(201) 874-3483

MODULE

APsystems
ALTENERGY POWER

Leading the Industry in
Solar Microinverter Technology



DS3 Series

The most powerful Dual Microinverter

- One microinverter connects to two solar modules
- Max output power reaching 640VA, 768VA or 880VA
- Two independent input channels (MPPT)
- CA Rule 21 (UL 1741 SB) compliant
- NEC 2020 690.12 Rapid Shutdown Compliant
- Encrypted Wireless ZigBee Communication
- Phase Monitored and Phase Balanced

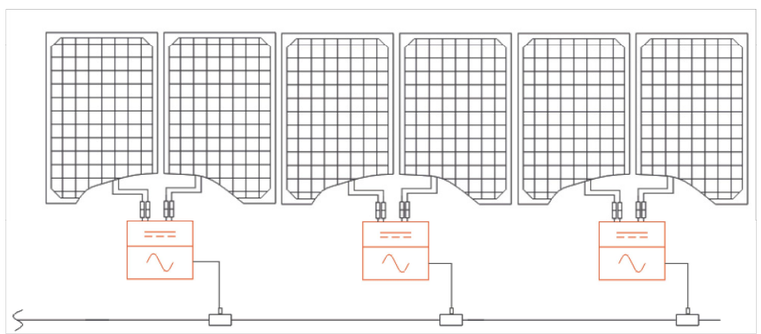
PRODUCT FEATURES

APsystems' 3rd generation of dual-module microinverters, the DS3 product family represents the culmination of years of power conversion expertise and innovation in high-efficiency, high-density power conversion to maximize the peak performance of today's high-capacity PV modules.

The DS3 series reaches unprecedented levels of power output. It features 2 input channels, each with independent MPPT, and encrypted wireless ZigBee communication. An innovative and compact design makes the product lighter while maximizing power production, and silicone-encapsulated components reduce stress on electronics, facilitate thermal dissipation, and enhance weatherproofing. Reliability is significantly increased thanks to 20% fewer components than previous generations. A 24/7 energy access through apps or web based portal facilitate remote diagnosis and maintenance.

The DS3 series is grid-interactive and fully compliant with CA Rule 21 requirements. With an excellent performance and high converstion efficiency, a unique integration with less components, the APsystems DS3 series is a gamechanger for residential and commercial solar.

WIRING SCHEMATIC



2024/02/22 Rev2.0

Datasheet | DS3 Microinverter Series

Model	DS3-S	DS3-L	DS3
Region		USA / Canada	
Input Data (DC)			
Recommended PV Module Power (STC) Range	250Wp-480Wp+	265Wp-570Wp+	300Wp-660Wp+
Peak Power Tracking Voltage		28V-45V	
Operating Voltage Range		26V-60V	
Maximum Input Voltage		60V	
Maximum Input Current	16A x 2	18A x 2	20A x 2
Maximum input short circuit current	20A per input	22.5A per input	25A per input
Output Data (AC)			
Maximum Continuous Output Power	640VA	768VA	880VA
Nominal Output Voltage/Range(1)		240V / 211V-264V	
Nominal Output Current	2.66A	3.2A	3.7A
Maximum Output Fault Current (ac) And Duration	5.691Apk, 26.75ms of duration; 3.307Arms		
Nominal Output Frequency/ Range(1)	60Hz/58.8Hz-61.2Hz(HECO:57Hz-63Hz)		
Power Factor (Default/Adjustable)	0.99/0.8 leading...0.8 lagging		
Maximum Units per 12AWG Branch(2)	6 (20A breaker)	5 (20A breaker)	4 (20A breaker)
Maximum Units per 10AWG Branch(2)	9 (30A breaker)	7 (30A breaker)	6 (30A breaker)
Efficiency			
Peak Efficiency	97.3%		
CEC Efficiency	97%		
Nominal MPPT Efficiency	99.5%		
Night Power Consumption	20mW		
Mechanical Data			
Operating Ambient Temperature Range(3)	-40°F to +149°F (-40°C to +65°C)		
Storage Temperature Range	-40°F to +185°F (-40°C to+85°C)		
Dimensions (W x H x D)	10.3" × 8.6" × 1.6" (263mm x 218mm x 41.2mm)		10.3" × 8.6" × 1.7" (263mm x 218mm x 42.5mm)
Weight	5.7lbs(2.7kg)		6.8lbs(3.1kg)
DC Connector Type	Stäubli MC4 PV-ADBP4-S2&ADSP4-S2		
Cooling	Natural Convection - No Fans		
Enclosure Environmental Rating	Type 6		
Features			
Communication (Inverter To ECU) (4)	Encrypted ZigBee		
Isolation Design	High Frequency Transformers, Galvanically Isolated		
Energy Management	Energy Management Analysis (EMA) system		
Warranty(5)	10 Years Standard ; 25 Years Optional		
Compliance			
Safety and EMC Compliance	UL1741; CSA C22.2 No. 107.1-16; UL1741SA; UL1741SB; IEEE1547; Rule 21; SRD-V2.0; FCC Part15; ICES-003; NEC2014&NEC2017&NEC2020 Section 690.11 DC Arc-Fault circuit Protection; NEC2014&NEC2017&NEC2020 Section 690.12 Rapid Shutdown of PV systems on Buildings		

(1) Nominal voltage/frequency range can be extended beyond nominal if required by the utility.
(2) Limits may vary. Refer to local requirements to define the number of microinverters per branch in your area.
(3) The inverter may enter to power de-grade mode under poor ventilation and heat dissipation installation environment.
(4) Recommend no more than 80 inverters register to one ECU for stable communication.
(5) To be eligible for the warranty, APsystems microinverters need to be monitored via the EMA portal. Please refer to our warranty T&Cs available on usa.APsystems.com.

Specifications subject to change without notice please ensure you are using the most recent update found at web : usa.APsystems.com

Meets the standard requirements for Distributed Energy Resources (UL 1741) and identified with the CSA Listed Mark

APsystems
8627 N. Mopac Expy, Suite 150, Austin, TX 78759
apsystems.com

DESIGN ENGINEER

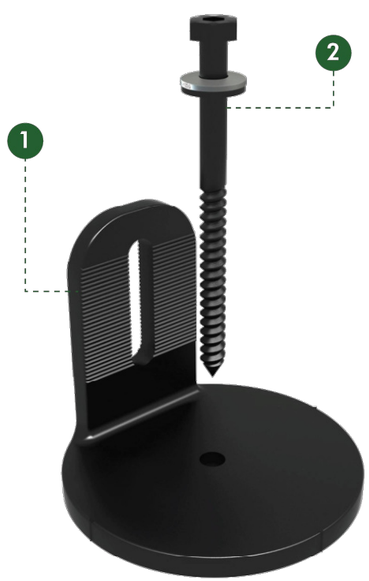
WYSSLING CONSULTING
CORPORATE EXPERIENCE WITH SMALL BUSINESS VALUE

76 N. MEADOWBROOK DRIVE
ALPINE UT 84004
swyssling@wysslingconsulting.com
(201) 874-3483

INVERTER

SUNMODO
We've Got Your Rack!

NanoMount™ (Rafter)

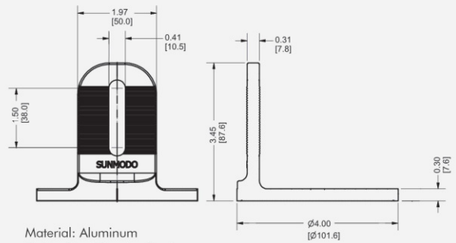


Part Description: Nano Rafter Mount, Black
Part No.: K50044-BK1

Item No.	Description	Qty in Kit
1	Nano Rafter Mount Assembly • Nano Rafter Mount • Nano Gasket	1
2	Lat Bolt Assembly • Hex Lag Bolt M8X115, DIN 571, 304S • Sealing Washer .33 ID X .75 X .157	1

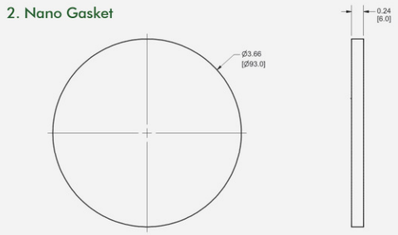
Cut Sheet

1. Nano Mount



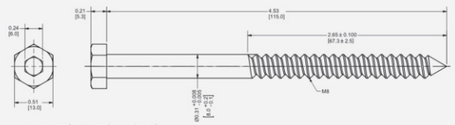
Material: Aluminum
Finish: Black Powder Coating

2. Nano Gasket



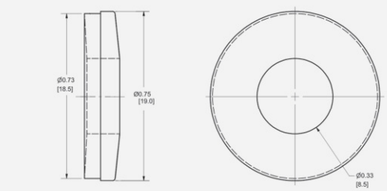
Material: USWR Silicone Foam Gasket with Adhesive

3. Hex Lag Bolt M8X115, DIN 571, 304SS



Material: Stainless Steel
Finish: Clear

4. Sealing Washer .33ID X.75X.157



Material: EPDM + Stainless Steel

D10213-V001
Dimensions shown are inches (and millimeters)
Details are subject to change without notice

DESIGN ENGINEER

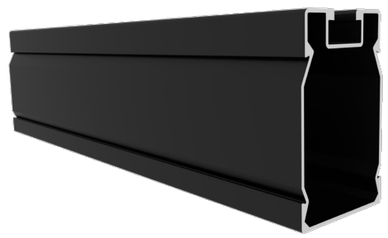
WYSSLING CONSULTING
CORPORATE EXPERIENCE WITH SMALL BUSINESS VALUE

76 N. MEADOWBROOK DRIVE
ALPINE UT 84004
swyssling@wysslingconsulting.com
(201) 874-3483

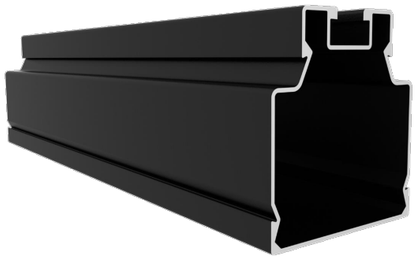
ATTACHMENT

SUNMOD

SMR100 Rail



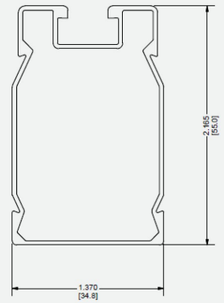
SMR200 Rail



Part Number	Description
A20422-168-BK	SMR100 Rail, Black Anodized, 168"
A20431-168-BK	SMR200 Rail, Black Anodized, 168"
A20440-BK1	SMR100 Rail End Cap, Black
A20440-BK2	SMR200 Rail End Cap, Black

Cut Sheet

SMR100 Rail



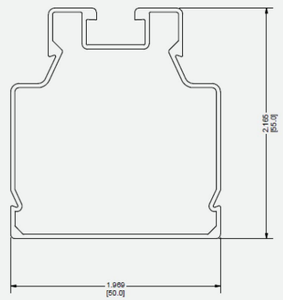
Mechanical Properties

Material: 6005-T5 Aluminum
Weight: 0.4126 lbs/ft (0.614 kg/m)
Ultimate Tensile Strength: 37.7 ksi (260 MPa)
Yield Strength: 34.8 ksi (240 MPa)

Section Properties

Sx: 0.196 in^3 (3.21 cm^3)
Sy: 0.146 in^3 (2.39 cm^3)
Area (X-section): 0.352 in^2 (2.27 cm^2)

SMR200 Rail



Mechanical Properties

Material: 6005-T5 Aluminum
Weight: 0.453 lbs/ft (0.626 kg/m)
Ultimate Tensile Strength: 37.7 ksi (260 MPa)
Yield Strength: 34.8 ksi (240 MPa)

Section Properties

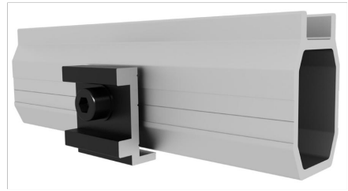
Sx: 0.223 in^3 (3.74 cm^3)
Sy: 0.189 in^3 (3.10 cm^3)
Area (X-section): 0.388 in^2 (1.22 cm^2)

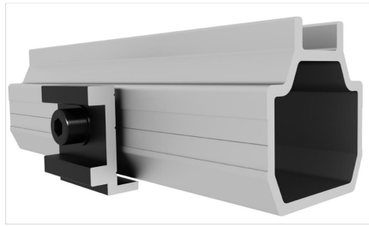
D10225-V001
Dimensions shown are inches (and millimeters)

Details are subject to change without notice

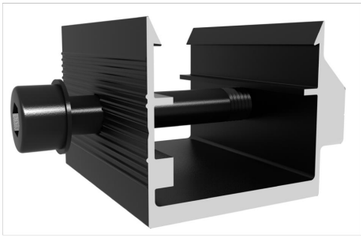
SUNMOD

SMR Rail Splices





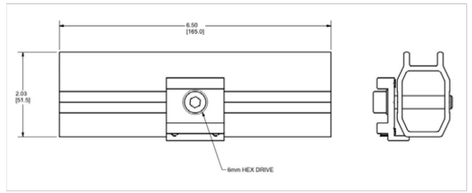
L-Foot Adaptors



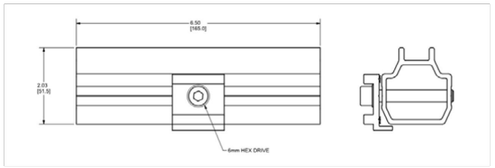
Part Number	Description
K10421-BK1	SMR100 Structural Bonding Rail Splice
K10427-BK1	SMR200 Structural Bonding Rail Splice
K10433-BK1	SMR100 L-Foot Adaptor
K10434-BK1	SMR200 L-Foot Adaptor

Cut Sheet

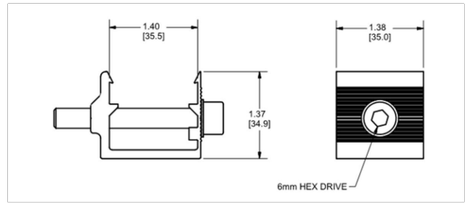
SMR100 Bonding Rail Splice Material: Aluminum



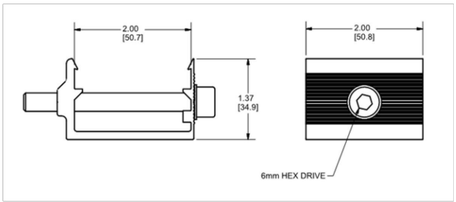
SMR200 Bonding Rail Splice Material: Aluminum



SMR 100 L-Foot Adaptor Material: Aluminum



SMR 200 L-Foot Adaptor Material: Aluminum



D10225-V001
Dimensions shown are inches (and millimeters)

Details are subject to change without notice

DESIGN ENGINEER

WYSSLING CONSULTING
CORPORATE EXPERIENCE WITH SMALL BUSINESS VALUE

76 N. MEADOWBROOK DRIVE
ALPINE UT 84004
swyssling@wysslingconsulting.com
(201) 874-3483

SUNMOD

Pop-On Mid Clamp

Pop-On End Clamp

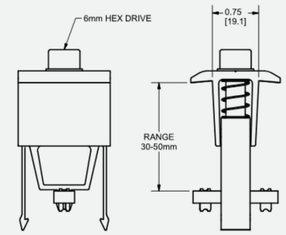
Shared Rail Mid/End Clamp

Part Number	Description
K10417-BK1	Pop-On Bonding Mid Clamp, Black
K10418-BK1	Pop-On End Clamp, Black
K10419-BK1	Shared Rail Bonding Mid Clamp, Black
K10420-BK1	Shared Rail End Clamp, Black

Cut Sheet

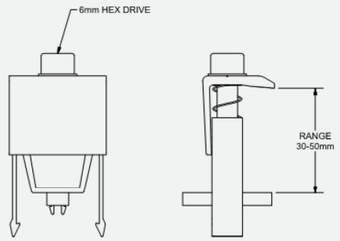
Pop-On Bonding Mid Clamp

Material: Aluminum



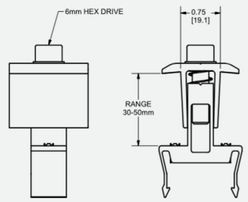
Pop-On End Clamp

Material: Aluminum



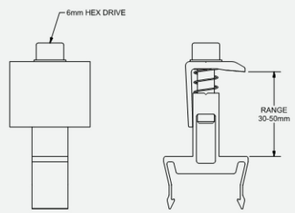
Shared Rail Bonding Mid Clamp

Material: Aluminum



Shared Rail End Clamp

Material: Aluminum



D10225-V001

Dimensions shown are inches (and millimeters)

Details are subject to change without notice

SUNMOD

SunDock Rail-Free Accessories

Parts Description:
Top Mount Cable Clip

Parts Description:
Side Mount Cable Clip

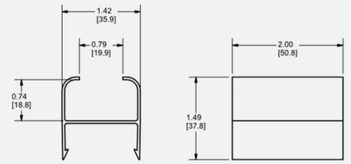
Parts Description:
Microinverter Mount

Part Number	Description
A20408-001	Top Mount Cable Clip
A20427-BK1	Side Mount Cable Clip (SMR100)
A20434-BK1	Side Mount Cable Clip (SMR200)
K50052-001	Microinverter Mount Kit

Cut Sheet

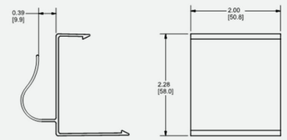
Top Mount Cable Clip

Material: Aluminum



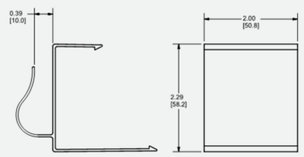
Side Mount Cable Clip (SMR100)

Material: Aluminum



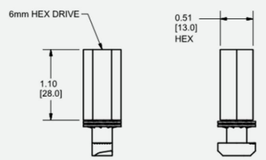
Side Mount Cable Clip (SMR200)

Material: Aluminum



Microinverter Mount

Material: Aluminum



D10225-V001

Dimensions shown are inches (and millimeters)

Details are subject to change without notice

DESIGN ENGINEER

WYSSLING CONSULTING
CORPORATE EXPERIENCE WITH SMALL BUSINESS VALUE

76 N. MEADOWBROOK DRIVE
ALPINE UT 84004
swyssling@wysslingconsulting.com
(201) 874-3483

SMR Pitched Roof System

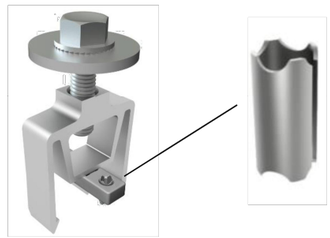
SUNMODO
LEADING by DESIGN

SunModo Racking Self-Bonding System

SunModo's SMR system meets the stringent requirements of UL 2703 and CSA C22.2 No. 61730-2 which covers rack mounting systems, mounting grounding/bonding components, and clamping/retention devices for photovoltaic (PV) modules. The SMR system is intended for, but not limited to, PV module installations on residential roof tops, commercial buildings, and freestanding ground mount structures.

The SMR system components are designed in accordance with the National Electrical Code, ANSI/NFPA 70 and Model Building Codes. These code requirements cover rack mounting systems and clamping devices intended for use with PV module systems with a maximum system voltage of 1500V.

The SMR self-bonding system is for use with PV modules that have a maximum series fuse rating of 30A. This means the maximum number of PV modules in the SMR system is limited by the system voltage, so if a system has multiple inverters, the SunModo racking system can theoretically go on forever.



Mid Clamp with Bonding Pins

DESIGN ENGINEER

WYSSLING CONSULTING
CORPORATE EXPERIENCE WITH SMALL BUSINESS VALUE

76 N. MEADOWBROOK DRIVE
ALPINE UT 84004
swyssling@wysslingconsulting.com
(201) 874-3483

MILBANK

Search

U4216-RXL

4 Terminal Ringless Large Hub Open Adapt To Small Closing Plate Lever Bypass External Hex

SPECIFICATIONS

Brand Name	Milbank
Type	Ringless Meter Socket
Application	Meter Socket
Standard	UL Listed;Type 3R
Voltage Rating	600 Volts Alternating Current
Amperage Rating	200 Continuous Ampere
Phase	1 Phase
Frequency Rating	60 Hertz
Size	4.844L x 13W x 19H
Number of Main Breakers	0
Main Breaker Size	No Main Breaker
Cable Entry	Overhead or Underground
Terminal	Lay in
Insulation	Glass Polyester
Mounting	Surface Mount
Material	G90 Galvanized Steel with Powder Coat Finish
Number of Jaws	4 Terminal
Bypass Provision	Lever Bypass
Number of Meter Positions	1 Position
Equipment Ground	Triplex Ground
Hub/Closing Plate	Large Hub Opening Adapted to Small Closing Plate
Line Side Wire Range	6 AWG - 350 kcmil
Load Side Wire Range	6 AWG - 350 kcmil
Number Of Receptacles	0
Height	19 IN
Length	4.844 IN
Width	13 IN

Appears In:

Kentucky, South
Indiana Area

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

DESIGN ENGINEER

WYSSLING CONSULTING
CORPORATE EXPERIENCE WITH SMALL BUSINESS VALUE

76 N. MEADOWBROOK DRIVE
ALPINE UT 84004
swyssling@wysslingconsulting.com
(201) 874-3483

PRODUCTION METER