WYSSLING CONSULTING
CORPORATE EXPERIENCE WITH SMALL BUSINESS VALUE

Scott E. Wyssling, PE
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76 North Meadowbrook Drive
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October 17, 2025

Re: Engineering Services
Dollar General Store #20397
1924 New Jersey 37, Manchester Township, NJ
68.440 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: 10" Z -Purlins at 60" o/c supported by 24" wide flange beams at 28' o/c
Roof Material: Standing Seam Metal
Roof Slope: 2.7 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 = 118 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 2021 International Building Code. 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 S-5! 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. System will be attached to the metal roofing material utilizing the patented S-5! connection. Installation of the connections shall be in accordance with the manufacturer's recommendations.
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 centers.

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 2021 International Building Code, 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
New Jersey License No. 41996
New Jersey COA # 24GA28352000

Signed 10/17/2025

NEW PV SYSTEM DESIGN

116 MODULES - 68.440 kW DC, 50.112 kW AC SYSTEM SIZE

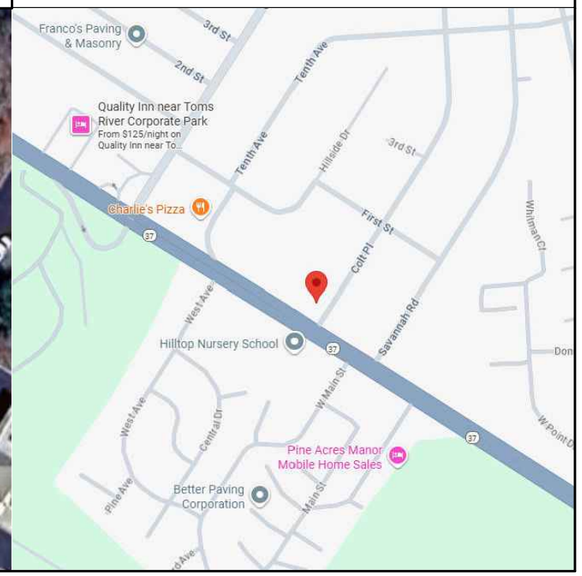
DOLLAR GENERAL STORE #20397 - 1924 NEW JERSEY 37, MANCHESTER TOWNSHIP, NJ 08759

AERIAL MAP

NTS

VICINITY MAP

NTS



SHEET INDEX

SCOPE OF WORK

SYSTEM SIZE: 68.440kW DC / 50.112kW AC SYSTEM SIZE
PV MODULE: (116) PHONO SOLAR PS590M8GF-24/TNH
INVERTER: (29) AP QT2-208
COMBINER: (1) MINIMUM 200A LOAD CENTER

ROOF STORIES: 1
ROOF TYPE(S): STANDING SEAM METAL
MOUNTING(S) & RACKING(S): S-5-U CLAMP WITH UNIRAC TILT KIT WITH UNIRAC NXT RAIL
FLASHING: N/A
ROOF HEIGHT: 15 FEET

INTERCONNECTION: LINE SIDE TAP
MAIN SERVICE PANEL LOCATION: 1ST FLOOR
MAIN SERVICE PANEL RATING: (E) 225A
MAIN BREAKER RATING: (E) 200A
OCPD: 175A FUSES

FIRSTENERGY METER NUMBER: 5003505901

GOVERNING CODES

2020 NATIONAL ELECTRIC CODE
2021 INTERNATIONAL BUILDING CODE
2021 INTERNATIONAL FIRE CODE
2021 INTERNATIONAL FUEL GAS CODE
2021 INTERNATIONAL EXISTING BUILDING CODE
2021 INTERNATIONAL ENERGY CONSERVATION CODE
2021 INTERNATIONAL MECHANICAL CODE
2021 INTERNATIONAL PLUMBING CODE

AS ADOPTED BY MANCHESTER TOWNSHIP INCLUDING ANY AMENDMENTS OR ADDITIONAL LISTED REQUIREMENTS. DESIGNED IN ACCORDANCE WITH THE REQUIREMENTS OF FIRSTENERGY UTILITY.

EQUIPMENT IS COMPATIBLE WITH UL2703, UL1741, UL1703 / UL61730, AND UL9540 AS APPLICABLE

DESIGN CRITERIA

WIND SPEED: 118 MPH
GROUND SNOW LOAD: 20 PSF
ASCE: 7-16
EXPOSURE CATEGORY: C
BUILDING OCCUPANCY: B
CONSTRUCTION TYPE: TYPE V-B
SPRINKLERS: NO

DATE	REVISION	COMMENT

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. 24GA28352000

SOLAR COMPANY/CLIENT

11 MILLION ACRES

11 MILLION ACRES
120 N. RACINE AVENUE, FLOOR 1
CHICAGO, IL

DOLLAR GENERAL STORE #20397
1924 NEW JERSEY 37
MANCHESTER TOWNSHIP, NJ 08759
COORDINATES: 39.995291, -74.276165

COVER PAGE

Signed 10/17/2025

SCOTT E WYSSLING, PE
NJ LICENSE NO 41996

DC SYSTEM SIZE: 68.440kW
AC SYSTEM SIZE: 50.112kW

AHJ: MANCHESTER TOWNSHIP
UTILITY: FIRSTENERGY

DRAWN BY: MK
INITIAL DESIGN DATE: 10/17/25 REV: A

PV-1

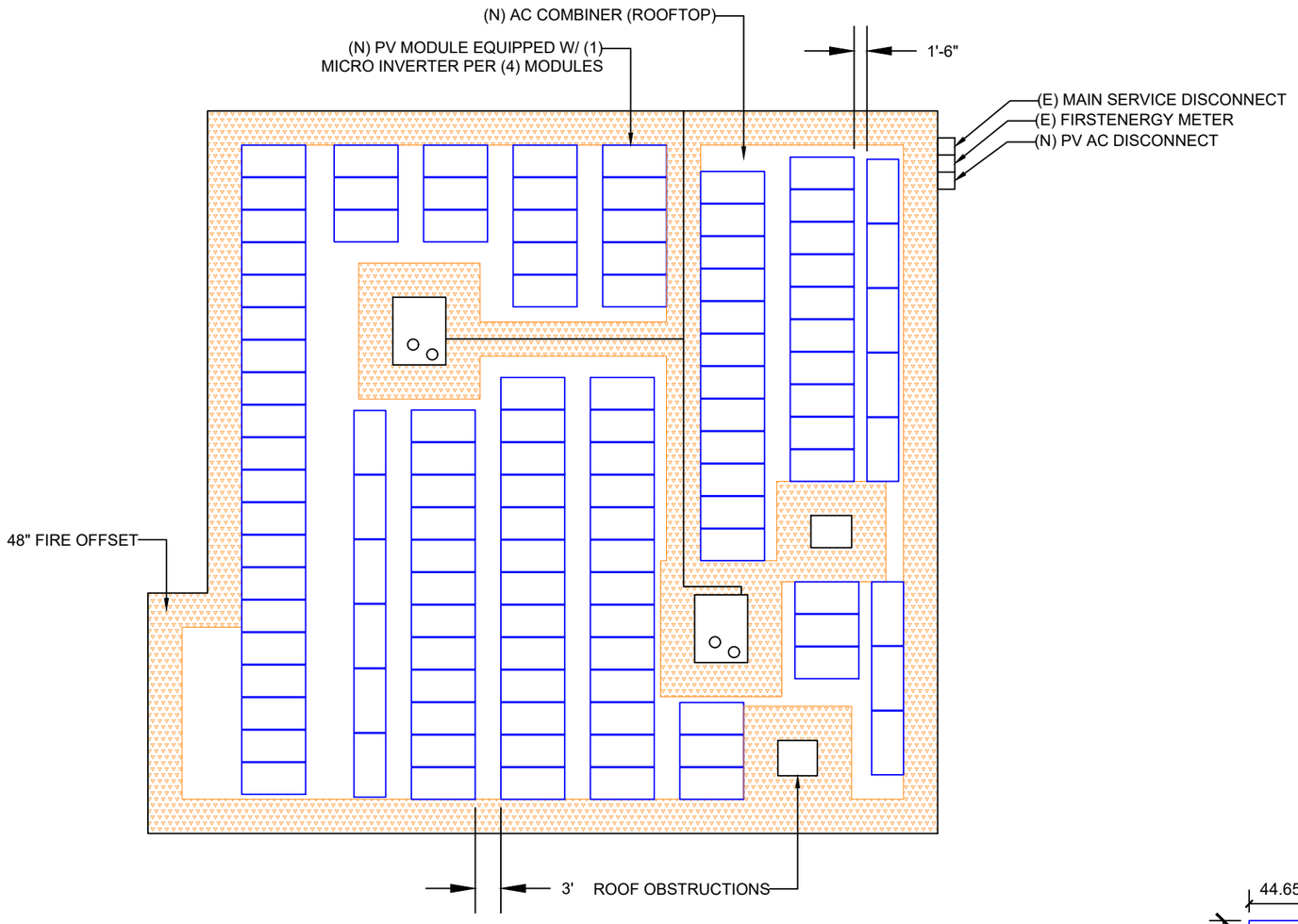
FIRSTENERGY METER NUMBER: 5003505901

SYSTEM INFORMATION	
MODULE COUNT/TYPE	(116) PHONO SOLAR PS590M8GF-24/TNH
INVERTER COUNT/TYPE	(29) AP QT2-208
MODULE WEIGHT	70.55 LBS
MODULE DIMENSIONS	89.69" x 44.65"
UNIT WEIGHT OF ARRAY	2.54 PSF

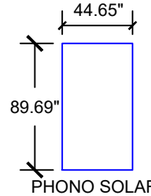
ROOF DESCRIPTION

ROOF #	ROOF TYPE	TILT	PITCH	ARRAY TILT	AZIMUTH	ROOF FRAMING	MAX ATTACHMENT SPACING	MODULE COUNT	ARRAY SQ. FT.
1	STANDING SEAM METAL	2.7°	1:12	10°	148°	10" Z -PURLINS AT 60" O/C SUPPORTED BY 24" WIDE FLANGE BEAMS AT 28' O/C	48"	116	3225.96

TOTAL ROOF AREA SQ. FT.	7423	TOTAL ARRAY SQ. FT.	3225.96	ROOF COVER %	43.46



1924 NEW JERSEY 37



PHONO SOLAR
PS590M8GF-24/TNH
MODULES

SITE PLAN NOTES

1. ALL OBSTRUCTIONS MUST BE VERIFIED BEFORE WORK COMMENCES
2. AC DISCONNECT SHALL BE READILY ACCESSIBLE 24/7
3. REQUIRED ELECTRICAL CLEARANCE TO BE MAINTAINED

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

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CHICAGO, IL

DOLLAR GENERAL STORE #20397
1924 NEW JERSEY 37
MANCHESTER TOWNSHIP, NJ 08759
COORDINATES: 39.995291, -74.276165

SITE PLAN

STATE OF NEW JERSEY · SCOTT E. WYSSLING · No. 41996 · LICENSED PROFESSIONAL ENGINEER

Signed 10/17/2025

SCOTT E WYSSLING, PE
NJ LICENSE NO 41996

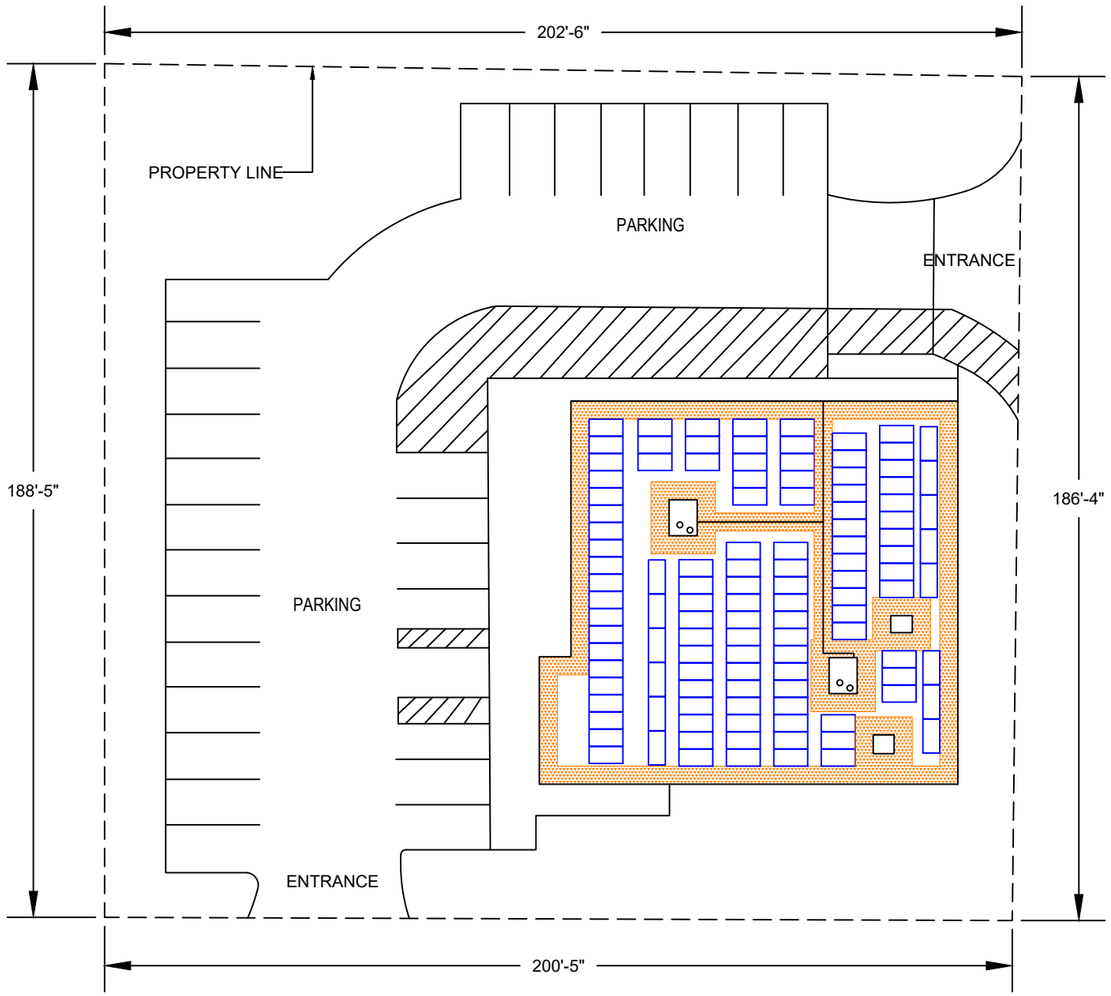
DC SYSTEM SIZE: 68.440kW
AC SYSTEM SIZE: 50.112kW

AHJ: MANCHESTER TOWNSHIP
UTILITY: FIRSTENERGY

DRAWN BY: MK
INITIAL DESIGN DATE: 10/17/25 REV: A

PV-2

FIRSTENERGY METER NUMBER: 5003505901



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

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COORDINATES: 39.995291, -74.276165

PROPERTY PLAN

STATE OF NEW JERSEY
SCOTT E WYSSLING
No. 41996
LICENSED PROFESSIONAL ENGINEER

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NJ LICENSE NO 41996

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AHJ: MANCHESTER TOWNSHIP
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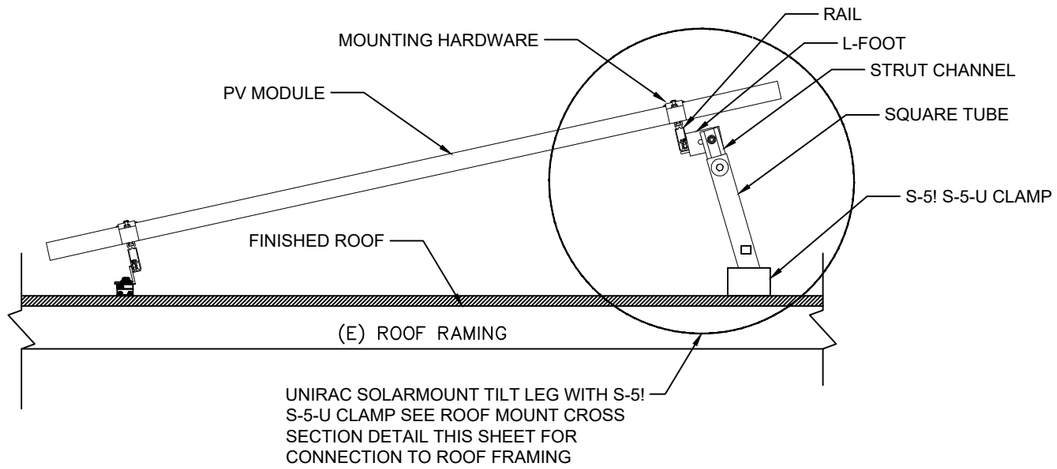
DRAWN BY: MK
INITIAL DESIGN DATE: 10/17/25 REV: A

PV-3

ROOF SECTIONS	R1	WIND SPEED: 118 MPH	GROUND SNOW LOAD: 20 PSF	ROOF TYPE: STANDING SEAM METAL	ROOF LAYERS (IF APPLICABLE): 1

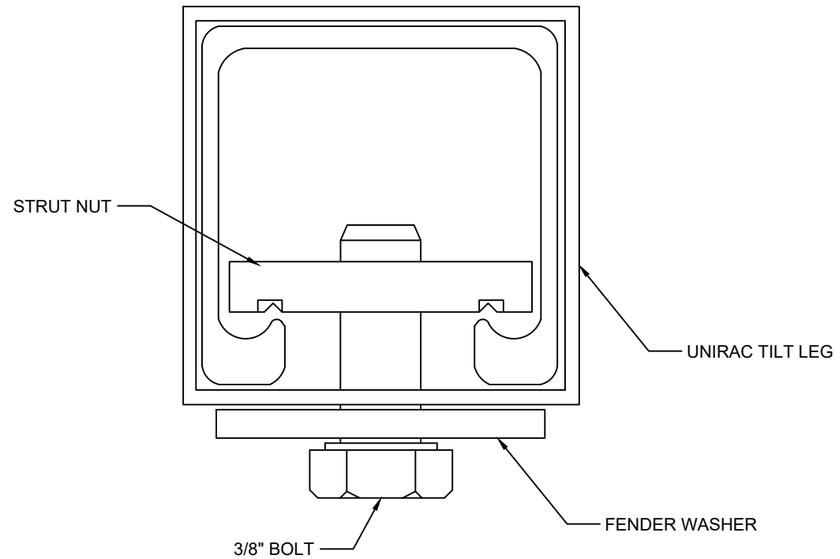
GENERAL ROOF MOUNT DETAIL

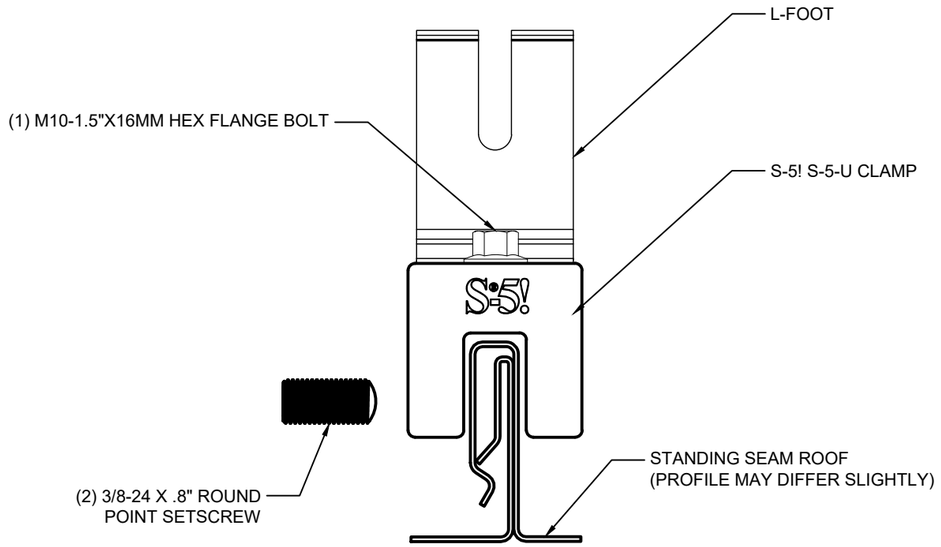
NTS



ROOF MOUNT PLAN VIEW DETAIL

NTS





ROOF MOUNT CROSS SECTION DETAIL

NTS

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MOUNTING DETAILS

STATE OF NEW JERSEY
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LICENSED PROFESSIONAL ENGINEER

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SCOTT E WYSSLING, PE
NJ LICENSE NO 41996

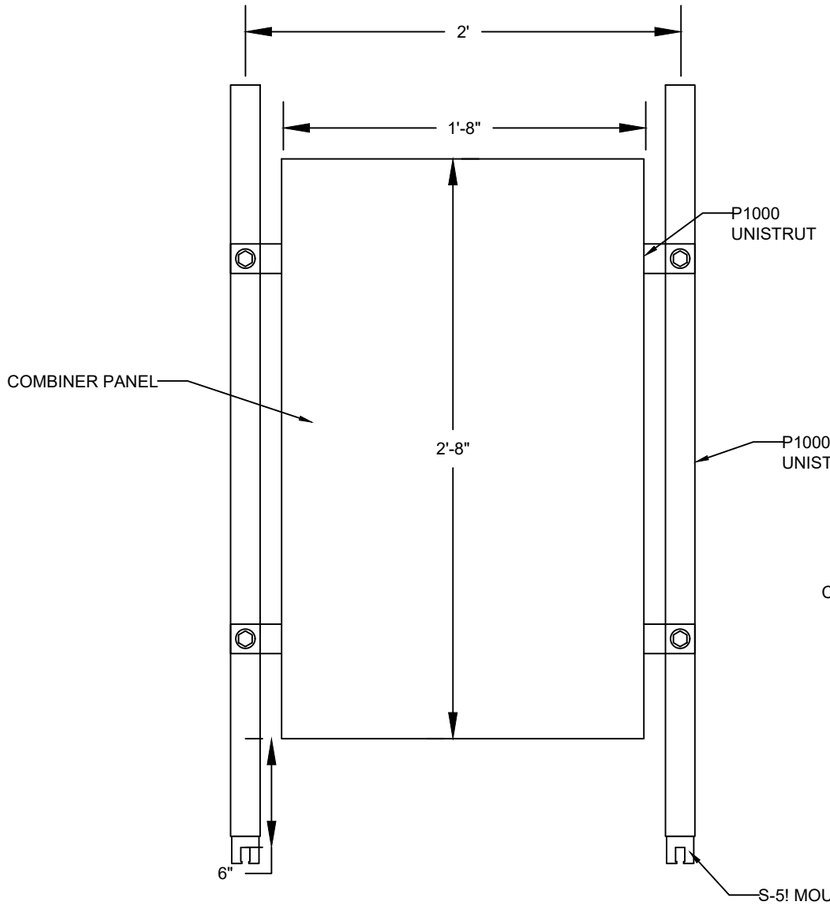
DC SYSTEM SIZE: 68.440kW
AC SYSTEM SIZE: 50.112kW

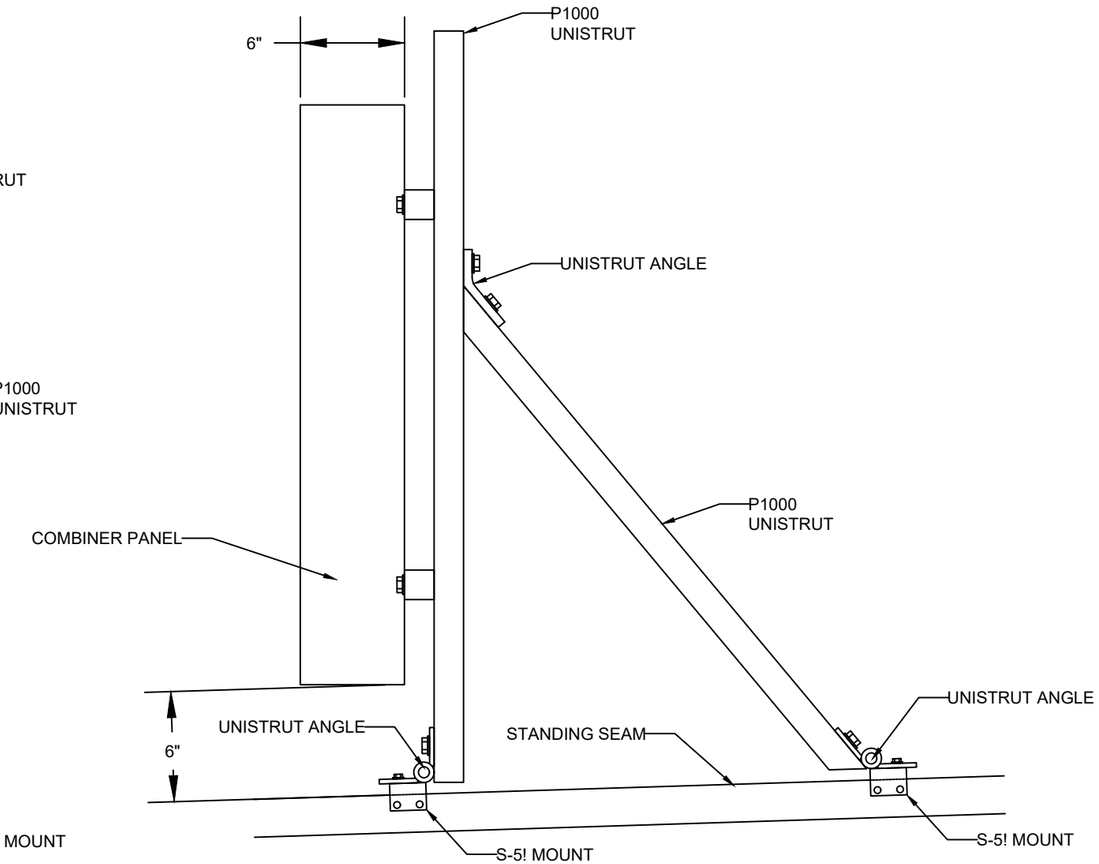
AHJ: MANCHESTER TOWNSHIP
UTILITY: FIRSTENERGY

DRAWN BY: MK
INITIAL DESIGN DATE: 10/17/25 REV: A

PV-4

FIRSTENERGY METER NUMBER: 5003505901





SCALE: 1:8

DESIGN ENGINEER

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COMBINER RACK

STATE OF NEW JERSEY
SCOTT E WYSSLING
No. 41996
LICENSED PROFESSIONAL ENGINEER

Signed 10/17/2025

SCOTT E WYSSLING, PE
NJ LICENSE NO 41996

DC SYSTEM SIZE: 68.440kW
AC SYSTEM SIZE: 50.112kW

AHJ: MANCHESTER TOWNSHIP
UTILITY: FIRSTENERGY

DRAWN BY: MK
INITIAL DESIGN DATE: 10/17/25 REV: A

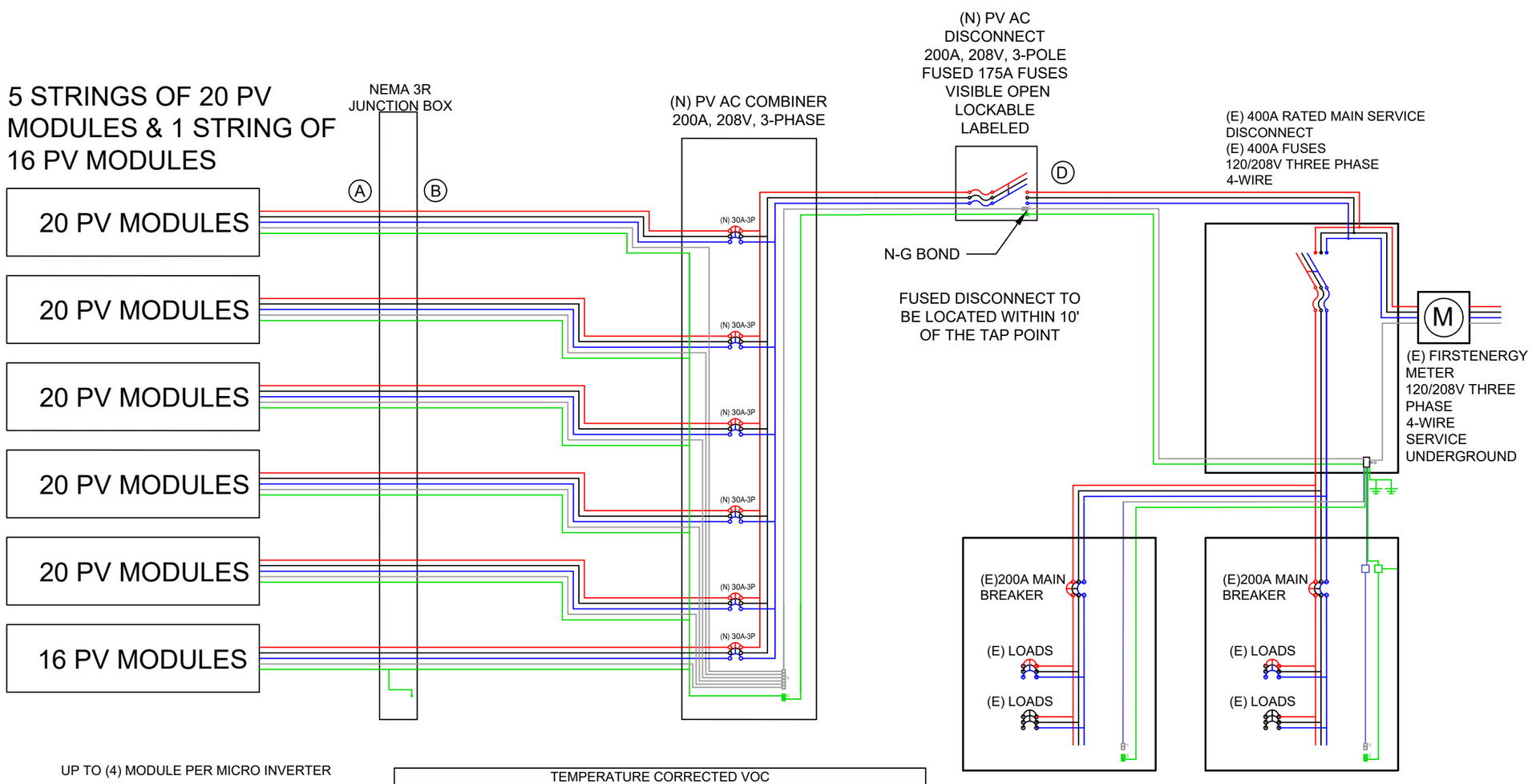
PV-5

CONDUCTOR SCHEDULE

TAG	NUMBER OF CONDUCTORS PER CONDUIT	NUMBER OF CONDUCTORS IN PARALLEL	MINIMUM UNGROUNDED CONDUCTOR SIZE	MINIMUM NEUTRAL CONDUCTOR SIZE	TYPE, MATERIAL	MINIMUM GROUNDING CONDUCTOR SIZE	GROUND TYPE, MATERIAL	CONDUIT	MAXIMUM AMPS	AMPS x 1.25	TEMPERATURE ADJUSTMENT	# OF CONDUCTORS ADJUSTMENT	ADJUSTED AMPS	CONDUCTOR AMPACITY	AMPACITY AT TERMINAL TEMP RATING	OCPD
A	9	1	10 AWG	10 AWG	TRUNK CABLE PV WIRE	6 AWG	BARE, CU	FREE AIR	24.00	30.00	0.96	N/A	25.00	40	35	30
B	9	1	10 AWG	10 AWG	THWN-2, CU	10 AWG	THWN-2, CU	1" EMT	24.00	30.00	0.96	0.70	35.71	40	35	30
C	5	1	2/0 AWG	2/0 AWG	THWN-2, CU	6 AWG	THWN-2, CU	2" EMT	139.20	174.00	0.96	0.80	181.25	195	175	175
D	5	1	2/0 AWG	2/0 AWG	THWN-2, CU	2 AWG	THWN-2, CU	2" EMT	139.20	174.00	0.96	0.80	181.25	195	175	175

MODULE TYPE: (116) PHONO SOLAR PS590M8GF-24/TNH
INVERTER TYPE: (29) AP QT2-208 208V

FIRSTENERGY METER NUMBER: 5003505901



UP TO (4) MODULE PER MICRO INVERTER

TEMPERATURE CORRECTED VOC

MODULE VOC	VOC COEFFICIENT	COLDEST TEMPERATURE	ADJUSTED VOC	INVERTER/ OPTIMIZER MAX
52.68	-0.25	-16.00	58.08	60, GOOD

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1924 NEW JERSEY 37
MANCHESTER TOWNSHIP, NJ 08759
COORDINATES: 39.995291, -74.276165

THREE LINE DIAGRAM

ELECTRICAL ONLY

STATE OF NEW JERSEY
GREGORY THOMAS ELVESTAD
No. 24GE05772400
LICENSED PROFESSIONAL ENGINEER

Signed 10/17/2025

GREG ELVESTAD, PE
NJ LICENSE NO 24GE05772400

DC SYSTEM SIZE: 68.440kW
AC SYSTEM SIZE: 50.112kW

AHJ: MANCHESTER TOWNSHIP
UTILITY: FIRSTENERGY

DRAWN BY: MK
INITIAL DESIGN DATE: 10/17/25 REV: A

EE-2

1) **PHOTOVOLTAIC AC DISCONNECT**
MAXIMUM AC OPERATING CURRENT: 139.2
NOMINAL OPERATING AC VOLTAGE: 208

AT POINT OF INTERCONNECTION, MARKED AT DISCONNECTING MEANS [NEC 690.56]

2) **⚠WARNING** DUAL POWER SOURCE
SECOND SOURCE IS PHOTOVOLTAIC SYSTEM

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

3) **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)]

4) PHOTOVOLTAIC
DC DISCONNECT

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

5) PHOTOVOLTAIC
AC DISCONNECT

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

6) **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)]

7) **⚠WARNING**
ELECTRICAL SHOCK HAZARD
DO NOT 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)]

8) ⚠ WARNING
PHOTOVOLTAIC SYSTEM
COMBINER PANEL
DO NOT ADD LOADS

AT AC COMBINER PANEL [NEC 690.13(B)]

9) **⚠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)(2)] (BREAKER INTERCONNECTION ONLY)

10) 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 690.12(D)]

11) 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 690.12(D)(2)]

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]

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COORDINATES: 39.995291, -74.276165

LABELS

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GREGORY THOMAS ELVESTAD
No. 24GE05772400
LICENSED
PROFESSIONAL ENGINEER

Signed 10/17/2025

GREG ELVESTAD, PE
NJ LICENSE NO 24GE05772400

DC SYSTEM SIZE: 68.440kW
AC SYSTEM SIZE: 50.112kW

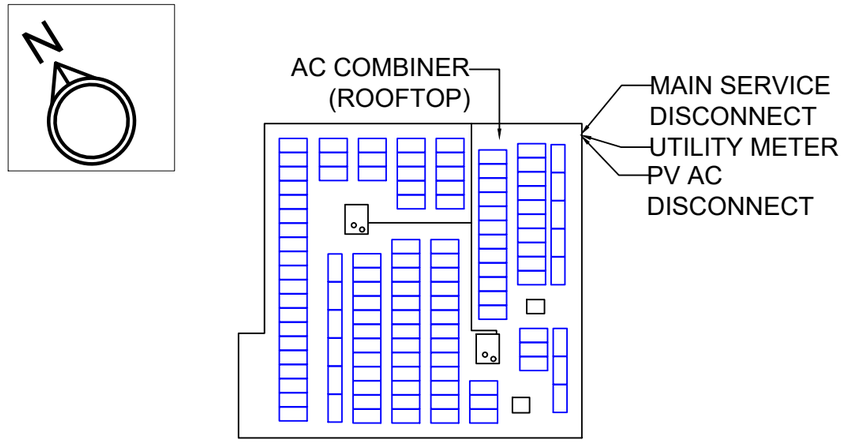
AHJ: MANCHESTER TOWNSHIP
UTILITY: FIRSTENERGY

DRAWN BY: MK
INITIAL DESIGN DATE: 10/17/25 REV: A

EE-2

CAUTION

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



1924 NEW JERSEY 37 MANCHESTER TOWNSHIP,NJ 08759

LOCATION: MSP
NEC 705.10

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PLACARD

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EE-3

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.
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.
16. AC DISCONNECT SHALL BE LOCATED WITHIN 10' OF FIRSTENERGY METER. AC DISCONNECT SHALL BE LOCATED ON SAME WALL OF HOUSE WHERE POSSIBLE. IF AC DISCONNECT CANNOT BE WITHIN 10' OF METER, THEN PHOTOS SHALL BE PROVIDED OF THE OBSTRUCTION FOR REVIEW.
17. IF APPLICABLE, ENERGY STORAGE SYSTEM (ESS) CAN BE USED DURING ON-GRID OPERATION TO SHIFT GENERATION FOR TIME OF USE (TOU) AND WILL NOT OPERATE OFF GRID.

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. ALL WIRING MUST BE PROPERLY SUPPORTED BY DEVICES OR MECHANICAL MEANS DESIGNED AND/OR LISTED FOR SUCH USE, AND FOR ROOF-MOUNTED SYSTEMS, WIRING MUST BE PERMANENTLY AND COMPLETELY HELD OFF OF THE ROOF SURFACE.
4. 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.
5. WIRING SHALL COMPLY WITH MAXIMUM CONTINUOUS CURRENT OUTPUT AT 25°C AND MAXIMUM VOLTAGE AT 600V; WIRE SHALL BE WET RATED AT 90°C.
6. EXPOSED PHOTOVOLTAIC SYSTEM CONDUCTORS ON THE ROOF WILL BE TYPE 2 OR PV-TYPE WIRE.
7. 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.
8. ALL CONDUCTORS AND TERMINATIONS SHALL BE RATED FOR INSTALL LOCATION
9. ALL EXTERIOR CONDUIT, FITTINGS, AND BOXES SHALL BE RAIN-TIGHT AND APPROVED FOR USE IN WET LOCATIONS.
10. ALL METALLIC RACEWAYS AND EQUIPMENT SHALL BE BONDED AND ELECTRICALLY CONTINUOUS.
11. WHERE SIZES OF JUNCTION BOXES, RACEWAYS, AND CONDUITS ARE NOT SPECIFIED, CONTRACTOR SHALL SIZE THEM ACCORDING TO APPLICABLE CODES.
12. 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.
13. 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.
14. FOR UNGROUNDED SYSTEMS, THE INVERTER IS EQUIPPED WITH GROUND FAULT PROTECTION AND A GFI FUSE PORT FOR GROUND FAULT INDICATION.
15. PV MODULE FRAMES SHALL BE BONDED TO RACKING RAIL OR BARE COPPER GEC/GEC PER THE MODULE MANUFACTURER'S LISTED INSTRUCTION SHEET.
16. 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.
17. THE PHOTOVOLTAIC INVERTER WILL BE LISTED AS UL 1741 COMPLIANT.
18. RACKING AND BONDING SYSTEM TO BE UL2703 RATED.
19. ANY REQUIRED GROUNDING ELECTRODE CONDUCTOR WILL BE CONTINUOUS, EXCEPT FOR SPLICES OR JOINTS AS BUSBARS WITHIN LISTED EQUIPMENT
20. WHEN BACKFEED BREAKER IS THE METHOD OF UTILITY INTERCONNECTION, THE BREAKERS SHALL NOT READ "LINE AND LOAD."
21. WHEN APPLYING THE 120% RULE, THE SOLAR BREAKER TO BE POSITIONED AT THE OPPOSITE END OF THE BUSBAR FROM THE MAIN BREAKER.
22. THE WORKING CLEARANCE AROUND THE EXISTING ELECTRICAL EQUIPMENT AS WELL AS THE NEW ELECTRICAL EQUIPMENT WILL BE MAINTAINED.
23. LISTED CONDUIT AND CONDUCTOR SIZES ARE BASED ON MINIMUM CODE REQUIREMENTS AND ARE NOT MEANT TO LIMIT UPSIZING AS REQUIRED BY FIELD CONDITIONS/AVAILABILITY.
24. AP QT2-208 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.
25. CALCULATIONS ARE BASED ON A) ASHRAE #2 AVERAGE HIGH = 32°C B)NEC TABLE 310.15(B)2(a) 75° DERATE FACTOR = 0.96 C) NEC TABLE NEC 310.15(B)(16) 75°C.
26. 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.
27. WHEN CABLE, INCLUDING PV CABLE(S), IS RUN BETWEEN ARRAYS OR TO JUNCTION BOXES IT SHALL BE ENCLOSED IN CONDUIT. [NEC 300.4, 690.31(A) AND (C)]
28. THE CABLE CONNECTORS USED ON THE OUTPUT SIDE OF THE OPTIMIZER OR MICROINVERTER TOGETHER WITH THE ARRAY CABLE USED BETWEEN THEM ARE OF THE SAME MANUFACTURER OR ARE LISTED FOR COMPATIBILITY. [NEC 690.33(C)]
29. SOME WIRE CONNECTORS SUPPLY INSTRUCTIONS FOR THE PRELIMINARY PREPARATION OF CONDUCTORS, SUCH AS USE OF CONDUCTOR TERMINATION COMPOUND (ANTIOXIDANT COMPOUND). SOME CONNECTORS ARE SHIPPED PRE-FILLED WITH CONDUCTOR TERMINATION COMPOUND (ANTIOXIDANT COMPOUND). FOR NON-PREFILLED CONNECTORS, CONDUCTOR TERMINATION COMPOUND MAY BE USED IF RECOMMENDED BY THE CONNECTOR MANUFACTURER AS PRELIMINARY PREPARATION OF THE CONDUCTOR.

DESIGN ENGINEER

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COA NO. 24GA28352000

SOLAR COMPANY/CLIENT

11 MILLION ACRES

11 MILLION ACRES
120 N. RACINE AVENUE, FLOOR 1
CHICAGO, IL

DOLLAR GENERAL STORE #20397
1924 NEW JERSEY 37
MANCHESTER TOWNSHIP, NJ 08759
COORDINATES: 39.995291, -74.276165

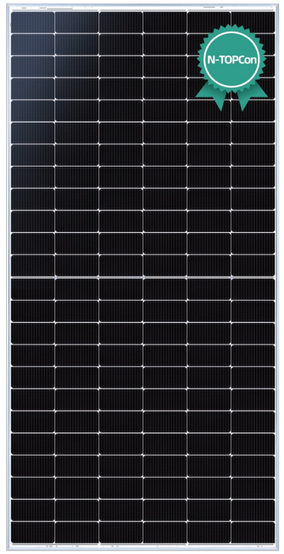
DESIGN NOTES

DC SYSTEM SIZE: 68.440kW
AC SYSTEM SIZE: 50.112kW

AHJ: MANCHESTER TOWNSHIP
UTILITY: FIRSTENERGY

DRAWN BY: MK
INITIAL DESIGN DATE: 10/17/25 REV: A

PV-6



PHONO

575-595w

Draco Module Series

N-TOPCON HIGH EFFICIENCY MONO BM6-16B-G

Bloomberg NEW ENERGY FINANCE Tier1 TOP PERFORMER 2023 PVEL PV MODULE RELIABILITY SCORECARD

Extraordinary Product Performance

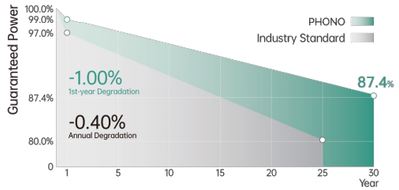
- Up to 30% additional power yield benefited from bifacial technology and up over 80% cell bifaciality
- Competitive high-temperature performance with ameliorated temperature coefficient
- Better weak illumination response, higher power generation with N-TOPCon technology

Higher Quality Reliability

- N-type with lower LID and LeTID
- Industry-leading cell processing technology and dual glass contributes to excellent anti-PID characteristic
- First-year degradation is less than 1.0%, with linear degradation of 0.4% per year for 30 years

Wider Application Conditions

- BIPV, vertical installation, snowfield, high-humid area, windy and dusty area
- Safer and easier handling during transportation and installation



15-year Product Warranty

30-year Linear Performance Warranty

MANAGEMENT SYSTEM CERTIFICATES

IEC 61215, IEC 61730

ISO 9001
2015 / Quality management system

ISO 14001
2015 / Standards for environmental management system

ISO 45001
2018 / International standards for occupational health & safety

www.phonosolar.com / info@phonosolar.com

Electrical Typical Values

Model	1000V	PS575M8GF-24/TNH		PS580M8GF-24/TNH		PS585M8GF-24/TNH		PS590M8GF-24/TNH		PS595M8GF-24/TNH	
	1500V	PS575M8GFH-24/TNH		PS580M8GFH-24/TNH		PS585M8GFH-24/TNH		PS590M8GFH-24/TNH		PS595M8GFH-24/TNH	
Testing Condition		STC	NOCT	STC	NOCT	STC	NOCT	STC	NOCT	STC	NOCT
Rated Power (Pmpp)		575	440	580	444	585	448	590	452	595	456
Rated Current (Impp)		13.36	10.76	13.42	10.81	13.48	10.86	13.54	10.91	13.60	10.95
Rated Voltage (Vmpp)		43.04	40.92	43.22	41.09	43.40	41.26	43.55	41.43	43.75	41.59
Short Circuit Current (Isc)		14.04	11.31	14.11	11.36	14.18	11.42	14.25	11.48	14.32	11.53
Open Circuit Voltage (Voc)		51.97	49.76	52.20	49.98	52.44	50.21	52.68	50.44	52.92	50.67
Module Efficiency (%)		22.26		22.45		22.65		22.84		23.03	

STC(Standard Testing Conditions): Irradiance 1000W/m², AM 1.5, Cell Temperature 25°C

NOCT (Nominal Operation Cell Temperature): Irradiance 800W/m², Ambient Temperature 20°C , Spectra at AM1.5, Wind at 1m/s

BNPI**

Maximum Power (Pmax)	630	635	640	645	650
Optimum Operating Current (Impp)	14.64	14.69	14.75	14.80	14.86
Optimum Operating Voltage (Vmpp)	43.04	43.22	43.40	43.58	43.75
Short Circuit Current (Isc)	15.34	15.40	15.45	15.50	15.55
Open Circuit Voltage (Voc)	51.97	52.20	52.44	52.68	52.92

**BNPI:Front Side Irradiation 1000W/m², Back Side Reflection Irradiation 135W/m² , AM 1.5, Ambient Temperature 25°C

Mechanical Characteristics

Cell Type	N Type Monocrystalline
Dimension (L × W × H)	Length: 2278mm (89.69 inch) Width: 1134mm (44.65 inch) Height: 30mm (1.18 inch)
Weight	32.0kg (70.55 lbs)
Glass	2.0mm/2.0mm toughened glass
Frame	Anodized Aluminium Alloy
Cable (Including Connector)	4mm² (IEC), (+): 450mm,(-): 250mm or Customized Length
Junction Box	IP 68 Rated

Temperature Ratings

Voltage Temperature Coefficient	-0.25%/°C
Current Temperature Coefficient	+0.04%/°C
Power Temperature Coefficient	-0.29%/°C
Power Tolerance	0~+3%
NOCT	42±2°C
Bifaciality	80±5%

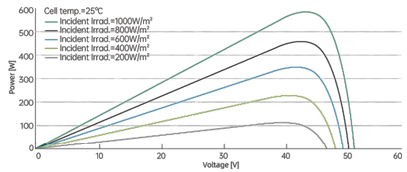
Absolute Maximum Rating

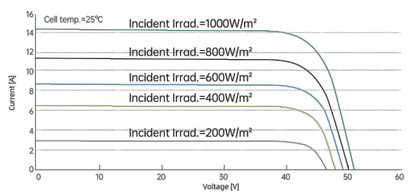
Operating Temperature	From -40 to + 85°C
Hail Diameter @ 80km/h	Up to 25mm
Front Side Maximum Static Loading	5400Pa
Rear Side Maximum Static Loading	2400Pa
Maximum Series Fuse Rating	30A
PV Module Classification	II
Fire Rating (IEC61730)	C
Maximum System Voltage	DC 1000V/1500V

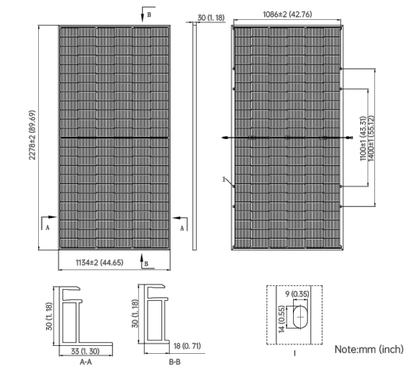
Packing Configuration

Container	20' GP	40' HQ
Pieces/Container	180	720
Pcs/Pallet	36	36
Pallets/Container	5	20

Electrical Characteristics







PHONO

PHONO SOLAR TECHNOLOGY CO., LTD. reserves the right to make necessary adjustments to the information described herein at any time without further notice. The specifications and certificates contained in this datasheet may deviate slightly from our actual products due to the on-going innovation and product enhancement. Please be sure to use the most recent version of data.

DESIGN ENGINEER

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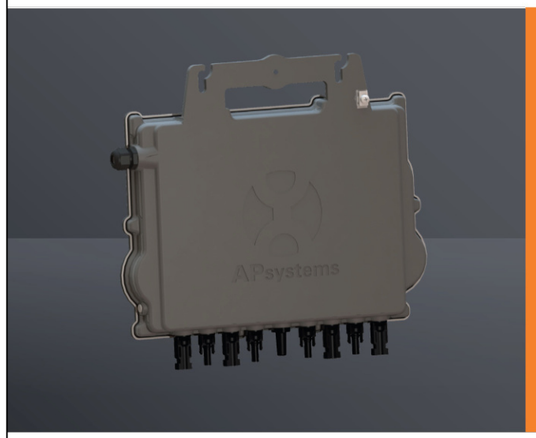
MODULE

APsystems
ALTENERGY POWER

Leading the Industry in
Solar Microinverter Technology



QT2

The most powerful 3-phase Quad microinverter

- Designed for 3-phase grid connection (208V or 480V)
- Single unit connects to 4 modules, 2 MPPTs, module-level DC voltage
- Maximum continuous AC output power 1728VA @ 208V, 1800VA @ 480V
- Engineered to harness today's high-capacity PV modules (Maximum input current 20A)
- Integrated safety protection relay
- Adjustable power factor
- Balancing 3-phase output
- Compatible with both △ and Y 3-phase grid

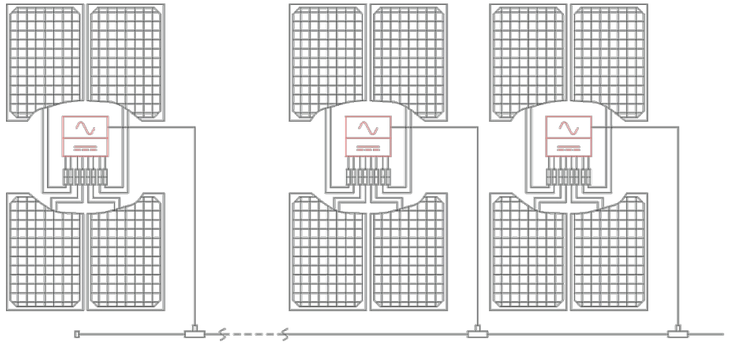
PRODUCT FEATURES

APsystems introduces its 2nd generation of native 3-phase quad microinverters, reaching unprecedented power outputs of 1728VA (for 208V) and 1800VA (for 480V) to harness the power of today's high-output PV modules. The QT2 microinverter gives commercial installers a powerful plug-and-play MLPE inverter that installs faster than competing solutions and is inherently compliant to rapid shutdown requirements.

With balancing 3-phase output, 4 DC inputs and encrypted ZigBee wireless, installers and system owners alike benefit from new QT2 architecture platform. The innovative design facilitates thermal dissipation while maximizing power production. The components are encapsulated with silicone to reduce stress on the electronics, dissipate heat, enhance waterproof properties, and ensure maximum reliability of the system. 24/7 access to performance data through apps or APsystems EMA web-based portal facilitate remote diagnosis and troubleshooting.

The new QT2 is grid interactive through its Reactive Power Control (RPC) feature, designed to better manage photovoltaic power spikes in the grid. With an excellent performance and high converstion efficiency, a unique integration with less components, the QT2 is a game changer for commercial solar.

WIRING SCHEMATIC



2024/08/15 Rev1.7

Datasheet | QT2 3-Phase Microinverter

Model	QT2-208	QT2-480
Region	USA/Canada	
Input Data (DC)		
Recommended PV Module Power (STC) Range	315Wp-670Wp+	
Peak Power Tracking Voltage	30V-45V	
Operating Voltage Range	26V-60V	
Maximum Input Voltage	60V	
Maximum Input Current	20A x 4	
Maximum input short circuit current	25A per input	
Output Data (AC)		
Maximum Continuous Output Power	1728VA	1800VA
Nominal Output Voltage/Range(1)	208V/183V-229V	480V/422V-528V
Nominal Output Current	4.8Ax3	2.17Ax3
Maximum Output Fault Current (ac) And Duration	L-L:85.4Apk, 13.6ms of duration, 4.967Arms	L-L:35.1Apk, 13.9ms of duration, 2.199Arms
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 30A branch(2)	5	11
AC Bus Cable	10AWG	
Efficiency		
Peak Efficiency	96.5%	
CEC Efficiency	96%	95.5%
Nominal MPPT Efficiency	99.5%	
Night Power Consumption	80mW	200mW
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)	14" × 9.5" × 1.8" (359mm X 242mm X 46mm)	
Weight	13 lbs (6kg)	
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	
Compliances		
Safety, EMC & Grid Compliances	UL1741; CSA C22.2 No. 107.1-16; UL1741SA; UL1741SB; IEEE1547; Rule 21; SRD-V2.0; FCC Part15; ICES-003; NEC2014&NEC2017&NEC2020&NEC2023 Section 690.11 DC Arc-Fault circuit Protection; NEC2014&NEC2017&NEC2020&NEC2023 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.
(6) APsystems' Microinverter Systems fully meet the rapid shutdown requirement without the need to install additional electrical equipment

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

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

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

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INVERTER

S-5!®

The Right Way!®

S-5-U Clamp

The S-5-U clamp is by far our most popular and most versatile clamp. It fits about 85% of the standing seam profiles manufactured in North America—including most structural and architectural profiles. It can be used on vertically oriented seams and, by rotating the clamp 90 degrees, it can also be used on most horizontal 2" seam profiles.

Its simple design, generous dimensioning, and multiple hole orientations are what make the S-5-U clamp so versatile for use with the S-5!® snow retention products, such as ColorGard®, as well as with other heavy-duty applications.

Installation is as simple as setting the specially patented round-point setscrews into the clamp, placing the clamp on the seam, and tightening them to the specified tension. Then, affix ancillary items using the bolt provided with the product. Go to www.S-5.com/tools for information and tools available for properly attaching and tensioning S-5! clamps.

S-5-U Mini Clamp

The S-5-U Mini is a bit shorter than the S-5-U and has one setscrew rather than two. The mini is the choice for attaching all kinds of rooftop accessories: signs, walkways, satellite dishes, antennas, rooftop lighting, lightning protection systems, solar arrays, exhaust stack bracing, conduit, condensate lines, mechanical equipment—just about anything!*

*S-5! mini clamps are not compatible with, and should not be used with S-5! SnoRail™/SnoFence™ or ColorGard® snow retention systems.

The S-5-U clamp is our most popular and versatile clamp, fitting about 85% of the standing seam profiles in North America.

The right way to attach almost anything to metal roofs!

S-5-U and S-5-U Mini

888-825-3432 | www.S-5.com |

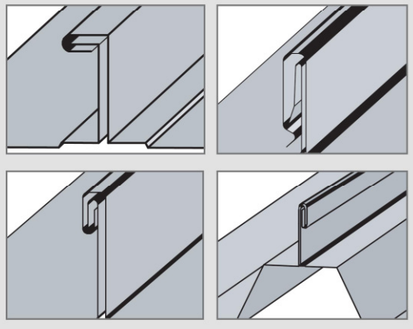
S-5!® The Right Way!®

The strength of the S-5-U clamp is in its simple design. The patented setscrews will slightly dimple the metal seam material but not pierce it—leaving the roof manufacturer's warranty intact.

The **S-5-U and S-5-U Mini clamps** are each furnished with the hardware shown to the right. Each box also includes a bit tip for tightening setscrews using an electric screw gun. A structural aluminum attachment clamp, the S-5-U is compatible with most common metal roofing materials excluding copper. All included hardware is stainless steel. Please visit **www.S-5.com** for more information including CAD details, metallurgical compatibilities and specifications.

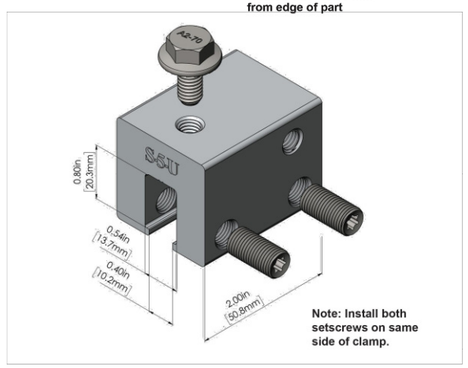
The S-5-U clamp has been tested for load-to-failure results on most major brands and profiles of standing seam roofing. The independent lab test data found at www.S-5.com can be used for load-critical designs and applications. S-5!® holding strength is unmatched in the industry.

Example Profiles

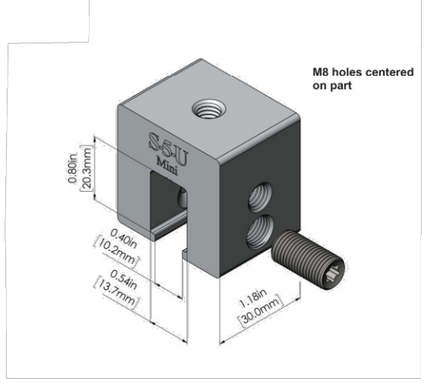


For horizontal seams under 0.65", do not use this clamp. Visit www.S-5.com for more detailed information and proper clamp usage.

S-5-U Clamp



S-5-U Mini Clamp



Please note: All measurements are rounded to the second decimal place.

S-5!® Warning! Please use this product responsibly!

Products are protected by multiple U.S. and foreign patents. Visit the website at www.S-5.com for complete information on patents and trademarks. For maximum holding strength, setscrews should be tensioned and re-tensioned as the seam material compresses. Clamp setscrew tension should be verified using a calibrated torque wrench between 160 and 180 inch pounds when used on 22ga steel, and between 130 and 150 inch pounds for all other metals and thinner gauges of steel. Consult the S-5! website at www.S-5.com for published data regarding holding strength.

Distributed by

DESIGN ENGINEER

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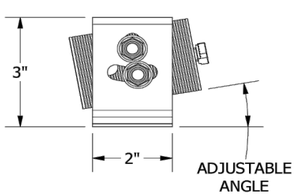
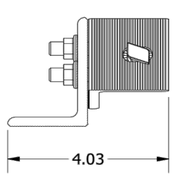
(201) 874-3483

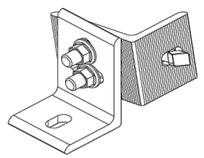
ATTACHMENT

PART # TABLE	
P/N	DESCRIPTION
SMTILTLEG12	SM ADJ TILT LEG, 12IN, W-HDW
SMTILTLEG30	SM ADJ TILT LEG, 30IN, W-HDW
M35355	KIT, SM TILT HDWR*

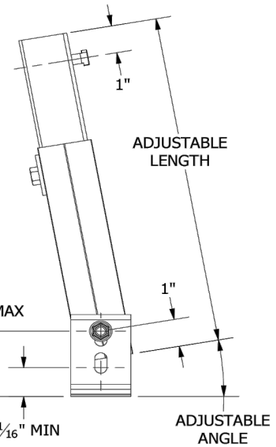
*NOTE - HARDWARE INCLUDED IN LEG KITS

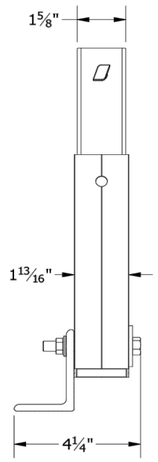


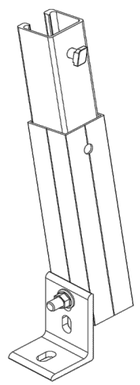




L-FOOT ASSY
SCALE 1/3





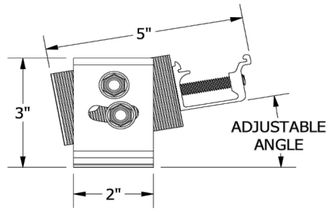


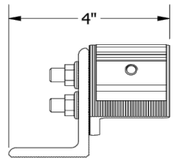
LEG ASSY
SCALE 1 / 4

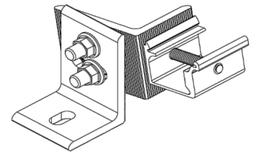
UNIRAC 1411 BROADWAY BLVD. NE ALBUQUERQUE, NM 87102 USA PHONE: 505.242.6411 WWW.UNIRAC.COM	PRODUCT LINE: SOLAR MOUNT DRAWING TYPE: ASSEMBLY DESCRIPTION: ADJUSTABLE TILT LEGS REVISION DATE: 4/17/2024	DRAWING NOT TO SCALE ALL DIMENSIONS ARE NOMINAL PRODUCT PROTECTED BY ONE OR MORE US PATENTS LEGAL NOTICE	SMTILT-01 SHEET

PART # TABLE	
P/N	DESCRIPTION
NUTILTLEG12	NXT UMOUNT ADJ TILT LEG, 12IN, W-HDW
NUTILTLEG30	NXT UMOUNT ADJ TILT LEG, 30IN, W-HDW
M35356	KIT, NXT TILT HDWR*

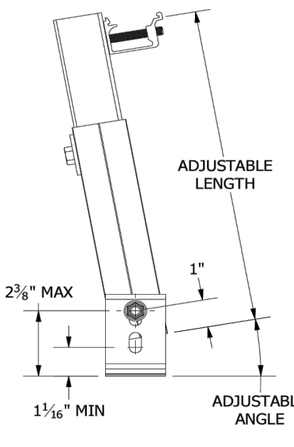
*NOTE - HARDWARE INCLUDED IN LEG KITS

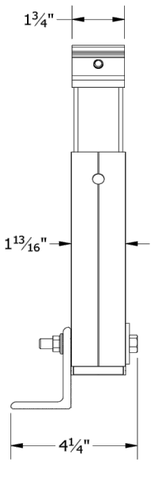


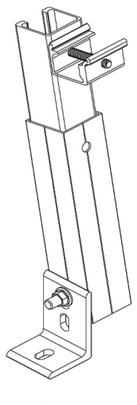




L-FOOT ASSY
SCALE 1/3







LEG ASSY
SCALE 1 / 4

UNIRAC 1411 BROADWAY BLVD. NE ALBUQUERQUE, NM 87102 USA PHONE: 505.242.6411 WWW.UNIRAC.COM	PRODUCT LINE: NXT UMOUNT DRAWING TYPE: ASSEMBLY DESCRIPTION: ADJUSTABLE TILT LEGS REVISION DATE: 4/17/2024	DRAWING NOT TO SCALE ALL DIMENSIONS ARE NOMINAL PRODUCT PROTECTED BY ONE OR MORE US PATENTS LEGAL NOTICE	NUTILT-01 SHEET

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ATTACHMENT

NXT UMOUNT™

UNIRAC
BETTER SOLAR STARTS HERE

UNIRAC 25 YEAR FULL-SYSTEM WARRANTY

DISCOVER **NXT** UMOUNT™

Introducing the Unirac NXT UMOUNT™ Solar Racking System – the culmination of over two decades of experience in the renewable energy industry. Built upon the pillars of thoughtful design, rigorous engineering, world-class support, and a reliable supply chain, the NXT UMOUNT™ is truly the embodiment of the NXT level of design, simplicity, and value.

NXT UMOUNT™ COMBO CLAMP

DARK: CCLAMPD1
MILL: CCLAMPM1

Clicks into rail anywhere (even where there are cables!) Self-standing clamp with spring combines as both mid and end clamp. Clamps 30-40 mm modules. 1/2 inch module spacing for efficiency.
Unirac-quality bonding that works both as mid and end clamps.

NEW NXT UMOUNT™ HIDDEN END CLAMP

NUHECLMP1

The NXT Hidden end clamp comes preassembled to the end cap with a pull wire, allowing the installer to easily slide the clamp into the rail, set the module, pull and hold the clamp in place while fastening in place, then cover the end of the rail for a sleek finish. Clamps any module with a return flange.

NXT UMOUNT™ CAP KIT

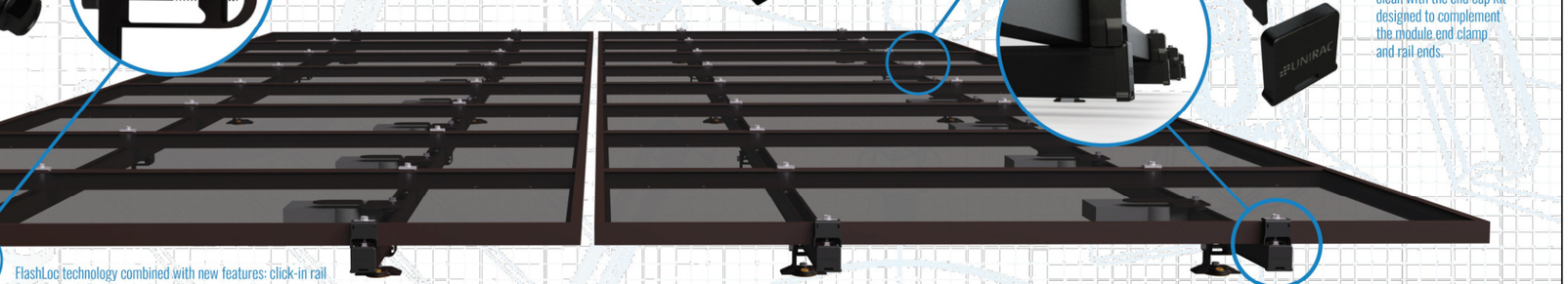
ENDCAPD1

Make the install look clean with the end cap kit designed to complement the module end clamp and rail ends.

STRONGHOLD™ RAIL CLAMP

DARK: SHCLMPD1
MILL: SHCLMPM1

Adaptable rail connection to attachments allows click-in feature compatibility with almost all of Unirac's attachments.



FlashLoc technology combined with new features: click-in rail & open slot L-Foot for the best flash-less install experience.

STRONGHOLD™ ATTACHMENT KIT

DARK: SHCPKTD1
MILL: SHCPKTM1

Rail clicks into the clamps attached to the STRONGHOLD™ base. Open slot in L-foot allows drop-in rail clamp.

Alternative attachment options:

SOLARHOOKS
All varieties

FLASHKIT PRO
DARK: 004055D
MILL: 004055M

FLASHLOC™ DUO
DARK: 004275D
MILL: 004275M

DIRECT-TO-DECK SCREWS

003251W

BUTYL™ PADS

XTRABUTL-SH

BUTYL™ ATTACHMENT KIT

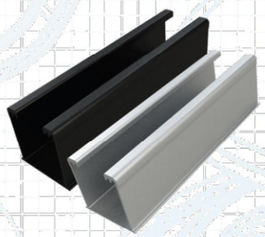
DARK: SHBUTYLD2
MILL: SHBUTYLM2

The pre-applied butyl pad removes the need for additional flashing. Just peel the liner, place the attachment, and fasten it to the roof. Butyl conforms to the screws and roof for a robust, dependable seal with no extra work!

NXT UMOUNT™ RAIL

DARK: 168RLD1
MILL: 168RLM1

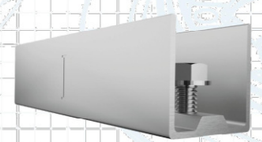
Strong, lightweight open channel rail with invisible, easy, unfailing and integrated wire management system.



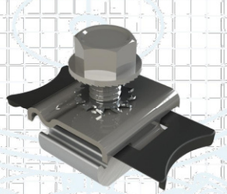
NXT UMOUNT™ RAIL SPLICE

RLSPLCM2

Structural internal splice that does not interfere with roof connection nor module connection, and can even install outside the cantilever! Pre-assembled thread cutting bolts.



WIRE MANAGEMENT OPTONS



NXT UMOUNT™ MLPE & LUG CLAMP

LUGMLPE1

Works as either MLPE Mount or Grounding Lug connection to the rail. Why source two parts when one can do the job?

NXT UMOUNT™ WIRE MANAGEMENT CLIP

WRMCLPD1

Aesthetic, yet functional accessory that works to help installers keep wires inside the rail. No zip-ties required. Optional zip tie loop for extra wire management capabilities!

NXT UMOUNT™ N/S WIRE MGMT CLIP

WRMCNSD1

An elegant solution to help installers get to the home run. The same hardware works to provide both easy entry to rail and adjustability for cable thickness.

FOR QUESTIONS OR CUSTOMER SERVICE VISIT UNIRAC.COM OR CALL 505-242-6411

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RAIL

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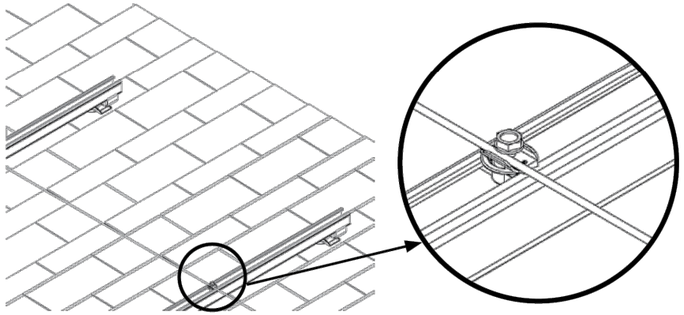
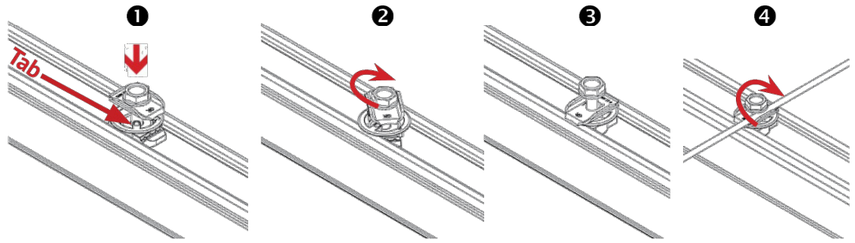
NXT UMOUNT™

SYSTEM GROUNDING | 17
INSTALLATION GUIDE | PAGE





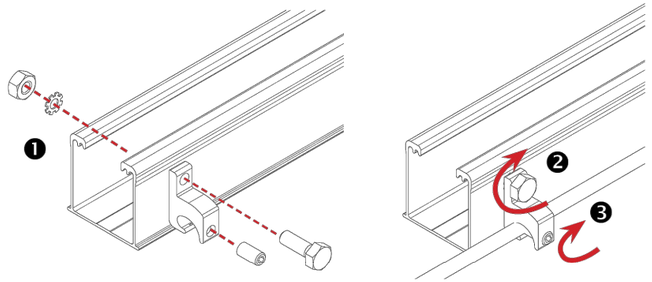
SYSTEM GROUNDING: Rails can be bonded using a MLPE & GROUNDING LUG (NULGMLP1), GROUND WEEBLUG #1 or ILSCO LAY IN LUG (GBL4DBT). At least one rail per row of modules in an array must be bonded to electrical ground. Each additional row of modules must be grounded with at least one rail lug per row or with a row-to-row bonding devise listed here.

Note: See Page 5 for additional lugs required for expansion joints.

SYSTEM GROUNDING WITH MLPE & GROUNDING LUG: Insert the T-nut in the rail by holding the plastic cone's tabs with thumb and middle finger. Rotate the clamp 90 deg in clockwise direction in the rail and release when aligned with rail. Ensure that the T-nut is engaged in the rail profile. Place the grounding wire on the grounding plate on one of the sides of the bolt, parallel to the grounding plate flanges. Tighten bolt.

TORQUE VALUE: 6-12 AWG SOLID COPPER: 10 ft lbs.

NOTE: MLPE & GROUNDING LUG is single use only

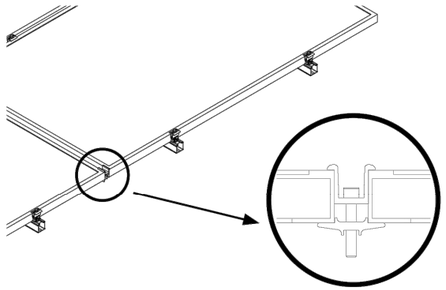


ALTERNATE SYSTEM GROUNDING WITH ILSCO LAY-IN LUG - UNIRAC P/N 008009P: Alternate Grounding Lug. Drill hole in rail 7/32" in diameter, deburr hole and bolt through one wall of rail.

BOLT TORQUE VALUE: 5 ft lbs.
TERMINAL TORQUE: 4-6 AWG: 35in-lbs, 8 AWG: 25 in-lbs.

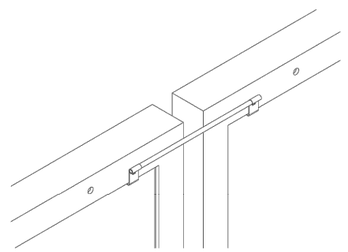
⚠ WARNING

Ensure Copper does contact Aluminum to avoid corrosion.

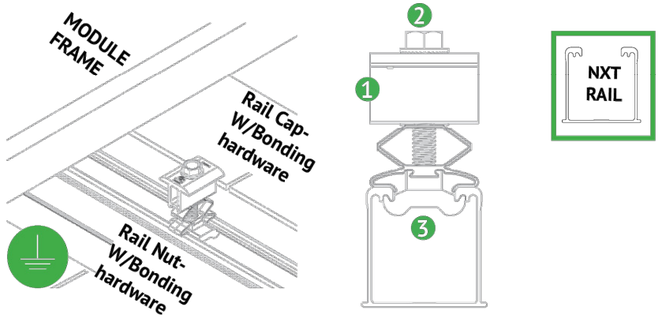


ALTERNATE ROW GROUNDING WITH N/S BONDING CLAMP:
Insert clamp between module rows and tighten bolt.

TORQUE VALUE: 20 ft-lbs.



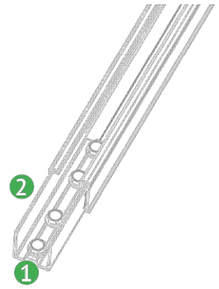
ALTERNATE ROW GROUNDING WITH N/S BONDING CLIP:
Fully seat bonding clip on each module flange to provide bond across N/S module gap.



BONDING COMBO MID-END CLAMP ASSEMBLY

1. Aluminum combo mid-end clamp cap with stainless steel bonding pins that pierce module frame anodization to bond module to module through clamp
2. Stainless steel bolt bonds aluminum clamp to stainless steel Hex bolt
3. Aluminum combo mid-end clamp rail nut with stainless steel bonding pins that pierce rail anodization to bond module to module through clamp

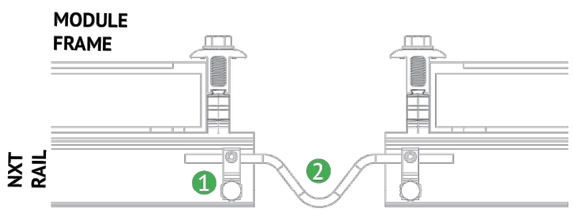
NOTE: See Page 20 for installation details.



BONDING RAIL SPLICE

1. Bonding Hardware creates bond between Splice bar and each rail section.
2. Aluminum splice bar spans across rail gap to create rail to rail bond. Rail on at least one side of splice will be grounded.

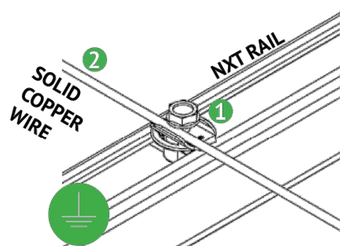
NOTE:
- **See Page 16 for installation details**
- **Splice certified for single-use only**



BONDING BETWEEN THERMAL BREAKS

1. Lug is connected at the end of each thermal break to the rail.
2. Solid copper wire is connected across the gap to bond the two ends.

NOTE: See Page 5 for installation details.



RACK SYSTEM GROUNDING

1. Tabs on the grounding plate pierce anodization on the rail to bond rail to ground wire.
2. Solid copper wire connected to lug is routed to provide final system ground connection.

NOTE: See Page 17 for installation details and alternate racking system grounding methods.

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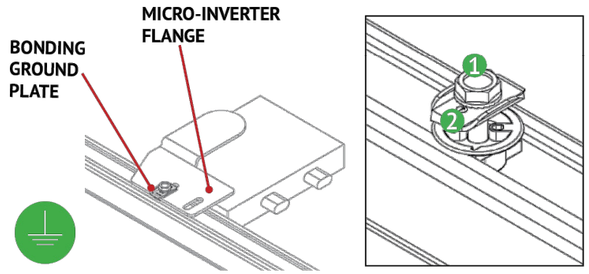
NXT UMOUNT™ BONDING CONNECTIONS & GROUNDING PATHS

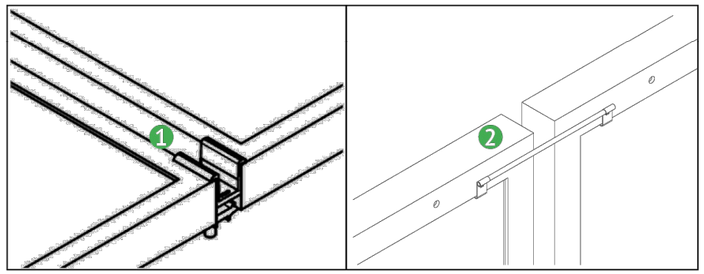
INSTALLATION GUIDE | 24 PAGE



BONDING MICROINVERTER MOUNT

1. Serrations on the bolt head remove the anodization of MLPE flange and bonds.
2. Tabs on the stainless steel ground plate remove anodization on the rail and bonds.

NOTE: See Page 18 for installation details



ALTERNATE ROW-TO-ROW BONDING PATHS

1. Row-to-row module bonding is accomplished with bonding clamp with 2 integral bonding pins.
2. Alternate method by connecting clips on either module to complete the bonding path.

NOTE:
- See Page 17 for installation details
- Row-to-row module bonding certified for single-use only

⚠ CAUTION

- **If loose components or loose fasteners are found during periodic inspection, re-tighten immediately.**
- **Any components showing signs of corrosion or damage that compromise safety shall be replaced immediately.**

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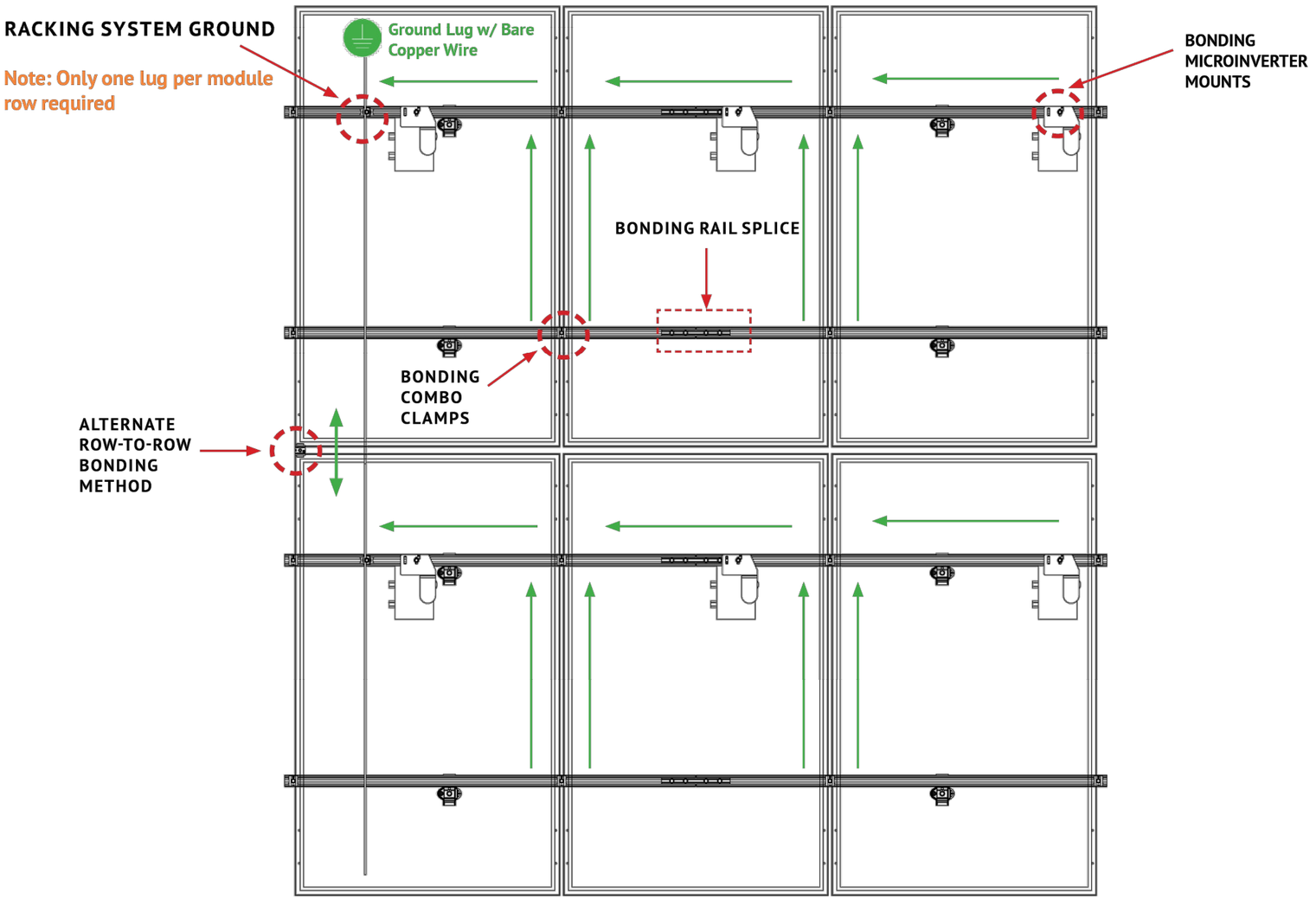
NXT UMOUNT™ BONDING CONNECTIONS & GROUNDING PATHS

INSTALLATION GUIDE | 25 PAGE



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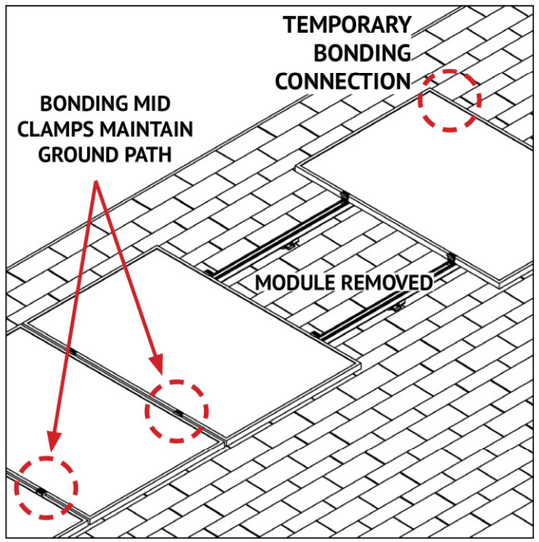
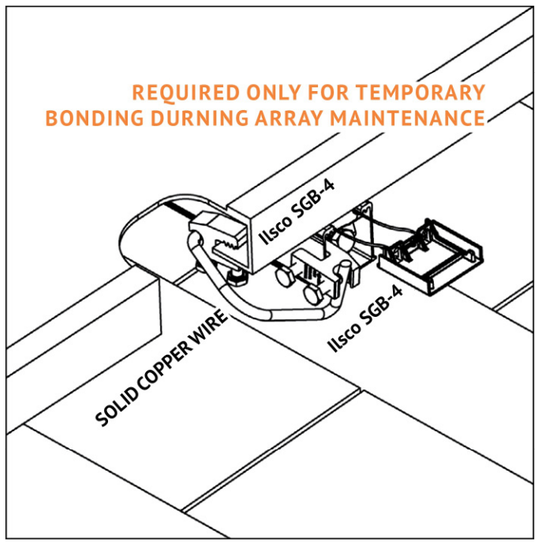
BONDING





TEMPORARY BONDING CONNECTION DURING ARRAY MAINTENANCE
When removing modules for replacement or system maintenance, any module left in place that is secured with a bonding Midclamp will be properly grounded. If a module adjacent to the end module of a row is removed or if any other maintenance condition leaves a module without a bonding mid clamp, a temporary bonding connection must be installed as shown

- Attach Ilsco SGB4 to wall of rail
- Attach Ilsco SGB4 to module frame
- Install solid copper wire jumper to Ilsco lugs

⚠ CAUTION

Module removal may disrupt the bonding path and could introduce the risk of electric shock. Follow above mentioned instructions to maintain the bonding path.

ELECTRICAL CONSIDERATIONS
NXT UMOUNT is intended to be used with PV modules that have a system voltage less than or equal to that allowable by NEC. For standard system grounding a minimum 10AWG, 105°C copper grounding conductor should be used to ground a system, according to the National Electric Code (NEC). It is the installer's responsibility to check local codes, which may vary. See below for interconnection information.

INTERCONNECTION INFORMATION
There is no size limit on how many NXT UMOUNT & PV modules can be mechanically interconnected for any given configuration, provided that the installation meets the requirements of applicable building and fire codes.

GROUNDING NOTES
The installation must be conducted by a licensed and bonded electrician or solar contractor in accordance with the National Electric Code (NEC) and the authority having jurisdiction. Please refer to these resources in your location for required grounding lug quantities specific to your project.

The grounding / bonding components may overhang parts of the array so care must be made when walking around the array to avoid damage.

Conductor fastener torque values depend on conductor size. See product data sheets for correct torque values.

PERIODIC INSPECTION
Conduct periodic inspections for loose components, loose fasteners or any corrosion, immediately replace any affected components.

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NXT UMOUNT™ MECHANICAL LOAD TEST SYSTEM CERTIFICATION

The NXT UMOUNT system has been certified and listed to the UL 2703 standard (Rack Mounting Systems and Clamping Devices for Flat-Plate Photovoltaic Modules and Panels). This standard included electrical grounding, electrical bonding, mechanical load and fire resistance testing.

SYSTEM LEVEL FIRE CLASSIFICATION

The system fire class rating requires installation in the manner specified in the NXT UMOUNT Installation Guide. NXT UMOUNT has been classified to the system level fire portion of UL 2703. NXT UMOUNT has achieved system level performance for steep sloped roofs and low sloped roofs. System level fire performance is inherent in the NXT UMOUNT design, and no additional mitigation measures are required. See table below for definition of steep sloped and low sloped roofs. The system is to be mounted over fire resistant roof covering rated for the application. There is no required minimum or maximum height limitation above the roof deck to maintain the system fire rating for NXT UMOUNT. Approved Module Types & System Level Fire Ratings are listed below:

Roof Type	Module Type	System Level Fire Rating	Rail Direction	Module Orientation
Steep Slope - roof pitches ≥ 2 in/ft	Type 1, 2, 3 with metal frame, 10 with metal frame, 19, 22, 25, 29, & 30	Class A	Parallel OR Perpendicular to Ridge	Landscape OR Portrait
Low Slope - roof pitches < 2in/ft	Type 1, 2, 29, & 30			

MECHANICAL LOAD TEST MODULES

The modules selected for UL 2703 mechanical load testing were selected to represent the broadest range possible for modules on the market. The tests performed covers module frame thicknesses greater than or equal to 1.0 mm, single and double wall frame profiles (some complex frame profiles could require further analysis to determine applicability), and clear and dark anodized aluminum frames. PV modules may have a reduced load rating, independent of the NXT UMOUNT rating. Please consult the PV module manufacturer's installation guide for more information.

Tested Module	Design Load Ratings	Tested Loads	Tested Module Area
SunPower SPR-A440 -COM	Down: 50 psf, Up: 50 psf , Slope: 15 psf	Down: 75 psf, Up: 75 psf , Slope: 23 psf	21.86 sq ft
Jinko JKM-xxxM 72HL4-V	Down: 39.47 psf, Up: 22.28 psf, Slope: 8 psf	Down: 59.20 psf, Up: 33.42 psf, Slope: 12 psf	27.76 sq ft
Q Cells Q Peak Duo XL-G11.3/BFG	Down: 37.06 psf, Up: 20.97 psf, Slope: 7.53 psf	Down: 55.6 psf, Up: 31.46 psf, Slope: 11.3 psf	29.49 sq ft

UL2703 CERTIFICATION MARKING:

Unirac NXT UMOUNT is listed to UL 2703. Certification marking is embossed on all Combo Clamps as shown. Labels with additional certification information are provided with clamps and must be applied to the NXT UMOUNT Rail at the edge of the array.

Note: This racking system may be used to ground and/or mount a PV module complying with UL1703/UL61730 only when the specific module has been evaluated for grounding and/or mounting in compliance with the included instructions.

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SPEC

NXT UMOUNT®

COMPATIBLE MODULES

SYSTEM CERTIFICATION

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Electrical Bonding and Grounding Test Modules

The list below is not exhaustive of compliant modules but shows those that have been evaluated and found to be electrically compatible with the NXT UMOUNT system.

Manufacture	Module Model / Series
Aionrise	AION60G1, AION72G1
Aleo	P-Series & S-Series
Aptos Solar	DNA-120-(MF/BF)10-xxxW DNA-120-MF10 DNA-120-(MF/BF)23 DNA-144-(MF/BF)23 DNA-120-(MF/BF)26 DNA-144-(MF/BF)26 DNA-108-(MF/BF)10-xxxW
Astronergy	CHSM6612 M, M/HV CHSM6612P Series CHSM6612P/HV Series CHSM72M-HC CHSM72M(DG)/F-BH
Auxin	AXN6M610T AXN6P610T AXN6M612T AXN6P612T
Axitec	AC-xxx(M/P)/60S, AC-xxx(M/P)/72S AC-xxxP/156-60S AC-xxxMH/120(S/V/SB/VB) AC-xxxMH/144(S/V/SB/VB)
Bluesun Solar	BSMxxxM10-72HBD
Boviet Solar	BVM6610, BVM6612 BVM6612M-XXXS-H-HC-BF-DG BVM7612M-H-HC-BF-DG

Manufacture	Module Model / Series
BYD	P6K & MHK-36 Series
Canadian Solar	CS1(H/K/U/Y)-MS CS3K-(MB/MB-AG/MS/P/P HE/PB-AG) CS3L-(MS/P), CS3N-MS CS3U-(MB/MB-AG/MS/P/P HE/PB/PB-AG) CS3W-(MB-AG/MS/P/P-PB-AG) CS3Y-MB-AG, CS5A-M CS6K-(M/MS/MS AllBlack/P/P HE) CS6P-(M/P), CS6R-MS CS6R-xxxMS-HL CS6U-(M/P/P HE), CS6W-(MB-AG/MS) CS6X-P, CSX-P, CS7L-MB-AG CS7L-xxxMB-AG ELPS CS6(A/P)-MM CS6.1-54TM-H CS6.1-60TM-H CS6.1-72TB-H
Centrosolar America	C-Series & E-Series
CertainTeed	CT2xxMxx-01, CT2xxPxx-01, CTxxxMxx-01 CTxxxPxx-01, CTxxxMxx-02, CTxxxMxx-03 CTxxxMxx-04, CTxxxHC11-04 CTM10400HC11-08, CTM10400HC11-09 CTM10400HC11-06
Eco Solargy	Orion 1000 & Apollo 1000
ET Solar	ET AC Module, ET Module ET-M772BH520-550WW/WB
First Solar	FS-6XXX(A) FS-6XXX(A)-P, FS-6XXX(A)-P-I

Manufacture	Module Model / Series
Flextronics	FXS-xxxBB
Freedom Forever	FF-MP-BBB-xxx, FF-MP1-BBB-xxx
FreeVolt	PVGraf
GCL	GCL-P6 & GCL-M6 Series
Hansol	TD-AN3, TD-AN4 UB-AN1, UD-AN1
Hanwha SolarOne	HSL 60
Heliene	36M, 36P 60M, 60P, 72M & 72P Series 144HC M6 144HC M10 SL Bifacial
H-SAAE	HT60-156M-C HT60-156M(V)-C HT72-156(M/P) HT72-156P-C, HT72-156P(V)-C HT72-156M(PDV)-BF, HT72-156M(PD)-BF HT72-166M, HT72-18X
Hyperion Solar (Runergy)	HY-DH108P8(B), HY-DH108N8B HY-DH144P8 HY-DH156N8 HY-DH156P8
Hyundai	KG, MG, RW, TG, RI, RG, TI, KI, HI Series HiA-SxxxHG, HiD-SxxxRG(BK), HiN-SxxxXG(BK), HiS-S400PI, HiS-SxxxYH(BK), HiS-SxxxXG(BK)
Illuminate USA	IL5-72HBD-xxx M IR8-66HGD-xxx M

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- Use with a maximum over current protection device OCPD of 30A
- Unless otherwise noted, all modules listed above include all wattages and specific models within that series. Variable wattages are represented as "xxx"
- Items in parenthesis are those that may or may not be present in a compatible module's model ID
- Slashes "/" between one or more items indicates that either of those items may be the one that is present in a module's model ID
- **Listed models can be used to achieve a Class A fire system rating, for steep slope or low slope applications, only when modules of fire typed mentioned in Appendix A, Page 27 are used.**

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MODULE COMPATABILITY

NXT UMOUNT® COMPATIBLE MODULES SYSTEM CERTIFICATION 30 PAGE

Electrical Bonding and Grounding Test Modules
The list below is not exhaustive of compliant modules but shows those that have been evaluated and found to be electrically compatible with the NXT UMOUNT system.

Manufacture	Module Model / Series
Imperial Star	ISM7-SHDD108-400/M
Inxeption	mSolar 108BB HC Series (TXI10-xxx108BB) mSolar 144BB HC Series (TXS6-xxx144BB)
ITEK	iT-SE Series
Japan Solar	JPS-60 & JPS-72 Series
JA Solar	JAM54S30 xxx/MR JAM54S31 xxx/MR JAM72D30MB, JAM78D10MB JAM72S30 /MR JAP6 60-xxx JAM6(K)-60/xxx, JAP6(k)-72-xxx/4BB JAP72S##-xxx/** JAP6(k)-60-xxx/4BB, JAP60S##-xxx/** JAM6(k)-72-xxx/**, JAM72S##-xxx/** JAM6(k)-60-xxx/**, JAM60S##-xxx/** i. ##: 01, 02, 03, 09, 10 ii. **: SC, PR, BP, HiT, IB, MW, MR ** = Backsheet, ## Cell technology
Jinko	JKM & JKMS Series JKMxxxM-72HL-V, JKMxxxM-72HLM-TV JKMxxxM-72HL4-(T)V, JKMxxxM-7RL3-V JKMxxxM-72HBL-V, JKMxxxM-72HL4-TV JKMxxxM-6RL3-B, JKMxxxN-72HL4-BDV JKMxxxN-54HL4-B, JKMxxxN-72HL4-TV JKMxxxM-7RL3-TV
Kyocera	KD-F & KU Series

Manufacture	Module Model / Series
LA Solar	LSxxxHC(166), LSxxxBF, LSxxxBL, LSxxxHC, BLA Model
LG Electronics	LGxxx(E1C/E1K/N1C/N1K/N2T/N2W/S1C/S2W/Q1C/Q1K)-A5 LGxxx(A1C/M1C/M1K/N1C/N1K/Q1C/Q1K/QAC/QAK)-A6, LGxxxN2W-B3 LGxxxN2T-B5, LGxxxN1K-B6 LGxxx(N1C/N1K/N2T/N2W)-E6 LGxxx(N1C/N1K/N2W/S1C/S2W)-G4 LGxxxN2T-J5 LGxxx(N1K/N1W/N2T/N2W)-L5 LGxxx(M1C/N1C/Q1C/Q1K)-N5 LGxxx(N1C/N1K/N2W/Q1C/Q1K)-V5 LGxxxN3K-V6
LONGi	LR4-60(HPB/HPH) LR4-72(HPH) LR5-54HABB-xxx M (fire type 29 only) LR5-54-HPB-xxx M LR5-72HBD xxx M LR6-60 LR6-60(BK/HPB/HPH/HV/PB/PE/PH) LR6-72 LR6-72(BK/HV/PB/PE/PH) LR7-72HGD-xxx M LR8-66HGD-xxx M RealBlack LR4-60HPB RealBlack LR6-60HPB

Manufacture	Module Model / Series
Maxeon	SPR-MAX3-xxx-COM SPR-MAX3-XXX-R SPR-MAX3-XXX-BLK-R
Meyer Burger	Meyer Burger Black, Meyer Burger White Meyer Burger Glass
Mission Solar Energy	MSExxxSX9R MSE Mono, MSE Perc MSExxx(SR8T/SR8K/SR9S/SX5T) MSExxx(SX5K/SX6W) MSExxxHT0B
Mitrex	Mxxx-L3H, Mxxx-I3H
Mitsubishi	MJE & MLE Series
mSolar	TXI10-xxx108BB
Neo Solar Power Co.	D6M Series
NE Solar	NESE xxx-72MHB-M10 NESE xxx-60MH-M6 NESE XXX 72MHT-M10 NESE XXX 72THB-M10 NESE XXX 72MHB-M10
Panasonic	VBHNxxxSA06/SA06B/SA11/SA11B VBHNxxxSA15/SA15B/SA16/SA16B, VBHNxxxKA, VBHNxxxKA03/04, VBHNxxxSA17/SA17G/SA17E/SA18/SA18E, VBHNxxxZA01/ZA02/ZA03/VBHNxxxZA04 EVPVxxx EVPVxxx(H/K/PK/HK/HK2)

- The frame profile must not have any feature that might interfere with the bonding devices that are integrated into the racking system
- Use with a maximum over current protection device OCPD of 30A
- Unless otherwise noted, all modules listed above include all wattages and specific models within that series. Variable wattages are represented as "xxx"
- Items in parenthesis are those that may or may not be present in a compatible module's model ID
- Slashes "/" between one or more items indicates that either of those items may be the one that is present in a module's model ID
- **Listed models can be used to achieve a Class A fire system rating, for steep slope or low slope applications, only when modules of fire typed mentioned in Appendix A, Page 27 are used.**

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MODULE COMPATABILITY

NXT UMOUNT®

COMPATIBLE MODULES

SYSTEM CERTIFICATION

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Electrical Bonding and Grounding Test Modules

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Manufacture	Module Model / Series
Peimar	SGxxxM (FB/BF) SMxxxM
Philadelphia Solar	PS-M108(HCBF)-400W (30 & 35mm frames)
Phono Solar	PSxxxM1-20/U, PSxxxM1H-20/U PSxxxM1-20UH PSxxxM1H-20UH PSxxxM4(H)-24/TH PSxxxM1-20/UH PSxxxM1H-20/UH PSxxxM-24/T PSxxxMH-24/T PSxxxM-24/TH PSxxxMH-24/TH
Prism Solar	P72 Series, P72X-xxx
Q Cells	Peak G5(SC) , G6(+)(SC)(AC), G7, G8(+), Peak L-G5, L-G6, L-G7, L-G8(BFF) Plus, Pro, Peak, G3, G4, Plus, Pro, Peak L-G2, L-G4, L-G5 Q.PEAK DUO(BLK)-G6+ Q.PEAK DUO (BLK)-G7 Q.PEAK DUO (BLK) G8(+) Q.PEAK DUO (BLK) ML-G10(a)(+) Q.PEAK DUO (BLK) ML-G9(+) Q.PEAK DUO BLK G10(+) Q.PEAK DUO BLK G10+ /AC Q.PEAK DUO BLK-G6+/TS Q.PEAK DUO BLK ML-G10+ / t Q.PEAK DUO BLK ML-G10+ / TS Q.PEAK DUO-G10+

Manufacture	Module Model / Series
Q Cells (Cont.)	Q.PEAK DUO L-(G7/G7.1/G7.2/G7.3/G7.7) Q.PEAK DUO L-(G8/G8.1/G8.2/G8.3) Q.PEAK DUO L-G6.3 / BFG Q.PEAK DUO L-G8.3 (BFF/BFG/BGT) Q.PEAK DUO XL-(G10/G10.2/G10.3/G10.c/ G10.d) Q.PEAK DUO XL-(G11.2/G11.3) Q.PEAK DUO XL-(G9/G9.2/G9.3) Q.PEAK DUO XL-G10.3/BFG Q.PEAK DUO XL-G10.d/BFG Q.PEAK DUO XL-G11.3/BFG Q.PEAK DUO XL-G11S Q.PEAK DUO XL-G11S.3 / BFG Q.PEAK DUO XL-G9.3/BFG Q.TRON BLK M-G2+ AC Q.TRON BLK M-G2+ SERIES Q.TRON M-G2+ SERIES Q.TRON XL-G2.3/BFG
REC	RECxxxAA (BLK/Pure/Pure-R/ Pure-RX/ Pure 2/ Pro M) RECxxxNP (N-PEAK) RECxxxNP2 (Black) RECxxxNP3 Black RECxxxPE, RECxxxPE72 RECxxxTP, RECxxxTP72 RECxxxTP2(M/BLK2) RECxxxTP2S(M)72 RECxxxTP3M (Black) RECxxxTP4 (Black)
Renesola	All 60-cell modules

Manufacture	Module Model / Series
Risen	RSM Series, RSM110-8-xxxBMDG
SEG Solar	SEG-xxx-BMD-HV, SEG-xxx-BMD-TB SEG-XXX-BMB-TB, SEG-xxx-BMA-HV SEG-xxx-BMA-TB, SEG-xxx-BMB-HV SEG-xxx-BMA-BG, SEG-xxx-BMB-BG SEG-xxx-BTA-BG, SEG-xxx-BTB-BG SEG-xxx-BMD-BG, SEG-xxx-BTD-BG
S-Energy	SN72 & SN60 Series SL45-60BGI/BHI SL45-60MBI-xxxZ
Seraphim	SEG-(6PA/6PB/6MA/6MA-HV/6MB/E01/E11) SRP-(6QA/6QB) SRP-xxx-6MB-HV, SRP-320-375-BMB-HV, SRP-xxx-BMC-HV, SRP-390-450-BMA-HV, SRP-xxx-BMZ-HV, SRP-390-405-BMD-HV
Sharp	NU-SA & NU-SC Series
Silfab	SLA-M, SLA-P, SLG-M, SLG-P & BC Series SILxxx(BG/BK/BL/HC/HC+/HL/HM/HN/ML/ NL/NT/NX/NU/QD/QM)
Solar4America	S4Axxx-108MH10BB, S4Axxx-72MH5BB S4Axxx-144MH10xxx, S4Axxx-144TH10xxx S4Axxx-144TH16xxx, S4Axxx-108MH10xxx S4Axxx-108TH10xxx
SolarEver USA	SE-166*83-xxxM-120N SE-182*91-xxxM-108N

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MODULE COMPATABILITY

NXT UMOUNT® COMPATIBLE MODULES SYSTEM CERTIFICATION 32 PAGE

Electrical Bonding and Grounding Test Modules
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Manufacture	Module Model / Series
Solaria	PowerXT-xxxR-(AC/PD/BD) PowerXT-xxxC-PD PowerXT-xxxR-PM (AC) PowerX-400R
Solartech	STU HJT, STU PERC & Quantum PERC
SolarWorld	Sunmodule Protect, Sunmodule Plus/Pro
Sonali	SS-M-360 to 390 Series SS-M-390 to 400 Series SS-M-440 to 460 Series SS-M-430 to 460 BiFacial Series
Sun Edison	F-Series, R-Series
Suniva	MV Series & Optimus Series (35mm)
Sunmac Solar	M754SH-BB Series
SunPower	AC, X-Series, E-Series & P-Series SPR E20 435 COM (G4 Frame) Axxx-BLK-G-AC, SPR-Mxxx-H-AC SPR-Mxxx-BLK-H-AC
SunTech	STP, STPXXXS - B60/Wnhb
Talesun	TP572, TP596, TP654, TP660 TP672, Hipor M, Smart TD6I72M, TP7G54M(H) TD7G72M
Tesla	SC, SC B, SC B1, SC B2, TxxxS, TxxxH
Thornova	TS-BG54

Manufacture	Module Model / Series
Trina	DE06, DE09.05, DE09C.07 DEG15HC.20(II), DEG15MC.20(II) DEG15VC.20(II), DE18M(II), DEG18MC.20(II) DE19, DEG19C.20 PA05, PD05, DD05, DD06 PD14, PE14, DD14, DE14, DE15, DE15V(II) TSM-DE09.08, TSM-DE09C.07, TSM-DE09.05 TSM-NE09RC.05 TSM-NEG19RC.20
TSMC	TS-150C2 CIGSw
Universal Solar	UNI4xx-144BMH-DG UNI5xx-144BMH-DG UNIxxx-108M-BB UNIxxx-120M-BB UNIxxx-120MH
Upsolar	UP-MxxxP, UP-MxxxM(-B)
URECO	D7Kxxx(H7A/H8A), D7Mxxx(H7A/H8A) F6MxxxE7G-BB FAKxxx(C8G/E8G), FAMxxxE7G-BB FAMxxxE8G(-BB), FBKxxxM8G FBMxxxM7G-BB FBMxxxMFG-BB
Vikram Solar	Eldora, Somera, Ultima PREXOS VSMDHT.60.AAA.05 PREXOS VSMDHT.72.AAA.05 Paradea VSMDH.72.AAA.05

Manufacture	Module Model / Series
Vina	VNS-72M1-5-xxxW-1.5, VNS-72M3-5-xxxW-1.5, VNS-144M1-5-xxxW-1.5, VNS-144M3-5-xxxW-1.5, VNS-120M3-5-xxxW-1.0
VSUN	VSUNxxx-60M-BB, VSUNxxx-72MH VSUN4xx-144BMH, VSUN4xx-144BMH-DG VSUN5xx-144BMH-DG, VSUNxxx-108M-BB VSUNxxx-120M-BB, VSUNxxx-120BMH VSUNxxx-132BMH, VSUNxxx-108BMH VSUNxxxN-144BMH, VSUNxxxN-144MH
VSUN (Cont.)	VSUNxxx-144BMH, VSUNxxx-144MH VSUNxxx-144M-BW, VSUNxxx-144M-BB
Waaree	Arka Series WSMDi
Winaico	WST & WSP Series
Yingli	YGE & YLM Series
Yotta Energy	YSM-B450-1
ZNShine Solar	ZXM7-SHLDD144 ZXM7-SHDB144 ZXM6-72 Series, ZXM6-NH144 ZXM6-NHLDD144, ZXM7-SH108 Series ZXM7-UHLDD144

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