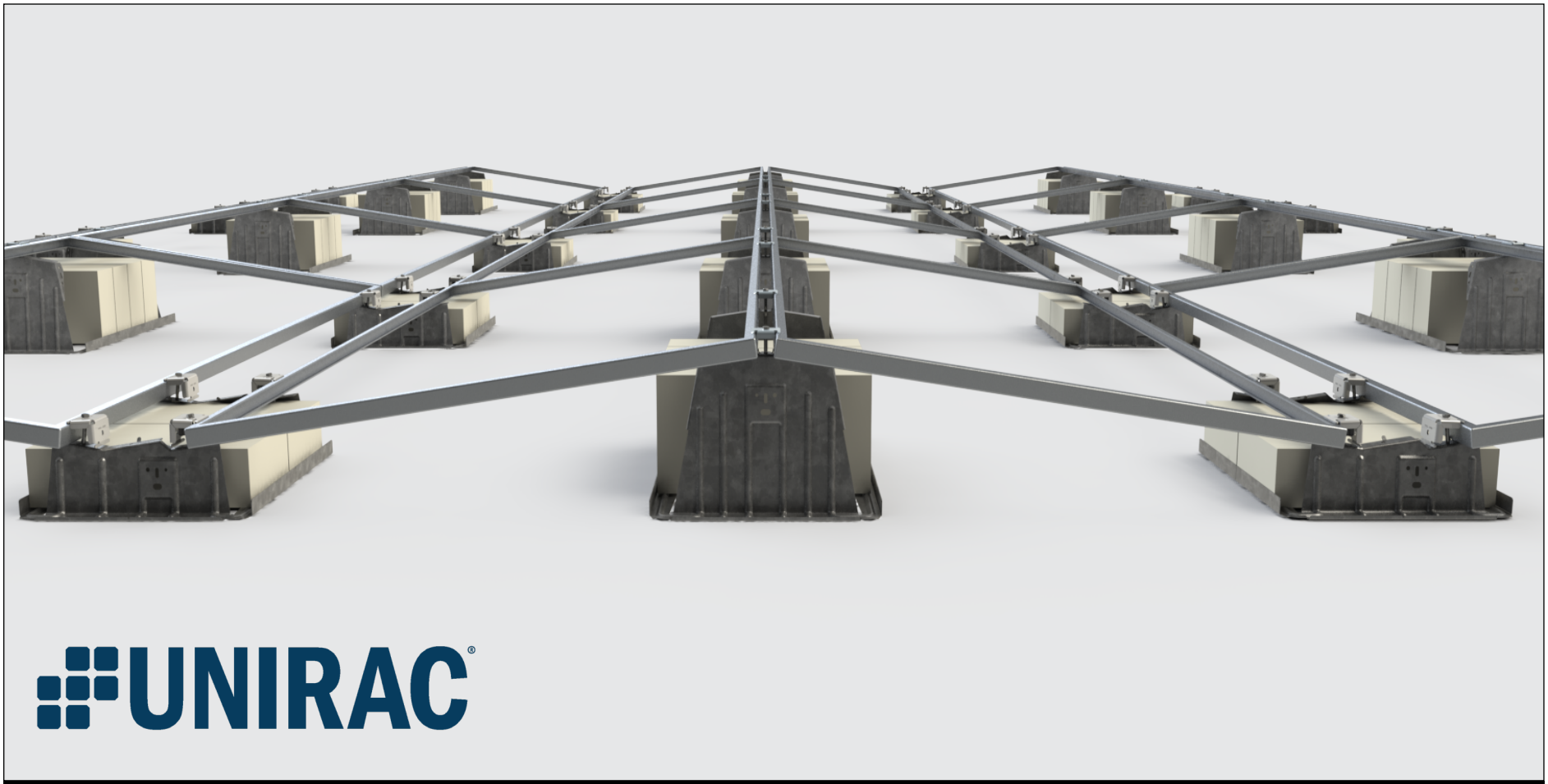
RMDT INSTALLATION GUIDE



UNIRAC

UNIRAC Code-Compliant Installation Manual

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RMDT INSTALLATION GUIDE

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GENERAL NOTES:

If provided refer to construction drawings for project specific details. Construction drawings have precedence over these installation guidelines.

RMDT

TOOLS & SPECIFICATIONS

TECHNICAL DATA SHEET | PAGE 1

TECHNICAL SPECIFICATIONS:

Material Types: 16G ASTM A653 GR50 Steel

Coating(s): G235 Galvanization, G180 Galvanization, G40 Galvinization + InterCoat® ChemGuard, G60 Galvinization + InterCoat® ChemGuard or G80 Galvinization + InterCoat® ChemGuard

Hardware: Stainless Steel

Bonding and Grounding: UL2703 Listed Continuous Bonding Path.

TOOLS REQUIRED OR RECOMMENDED FOR LAYOUT, ATTACHMENTS & INSTALLATION:

- Drill **(Do Not Use An Impact Driver)**
- 7/16" Socket
- Torque Wrench
- Tape Measure
- Chalk Reel
- Optional Spacers (See Diagram - Page Right)

GENERAL HARDWARE:

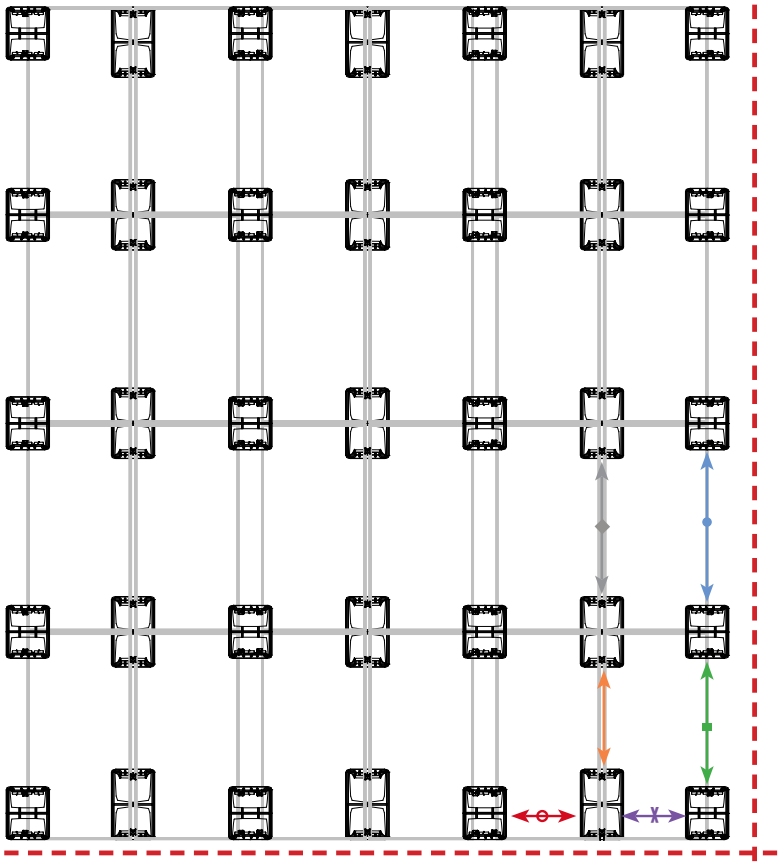
- ¼-20 X 2 ½" Hex Head Bolt - Module Clamps
- ¼-20 Stainless Steel U-Nuts

SAFETY:

All applicable OSHA safety guidelines should be observed when working on a PV installation job site. The installation and handling of PV solar modules, electrical installation and PV racking systems involves handling components with potentially sharp metal edges. Rules regarding the use of gloves and other personal protective equipment should be observed.

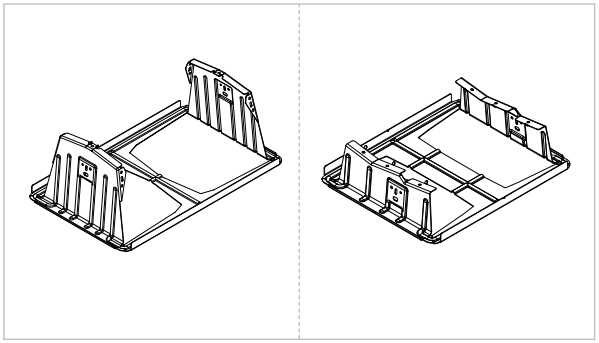
LAYOUT ASSISTANCE TOOL:

Module Dimensions:		RMDT	Module location:	Spacing Equations (in Inches):
Module Length (ML) =		1	Valley N/S Column Spacing =	ML+G-19.70"
Module Width (MW) =		2	Edge Valley N/S Column Spacing =	ML+G/2-29.55"
Prefered module gap? (1/4" - 1" is permissible)		3	Edge E/W Row Spacing =	(MW x 0.990) - 15.69"
		4	E/W Row Spacing =	(MW x 0.990) - 11.20"
East/West Module Gap (G) =		5	Ridge N/S Column Spacing =	ML+G-26.20"
		6	Edge Ridge N/S Column Spacing =	ML+G/2-39.30"

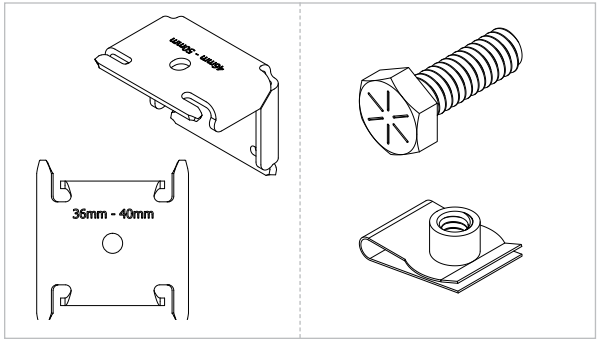


SPACERS - OPTIONAL

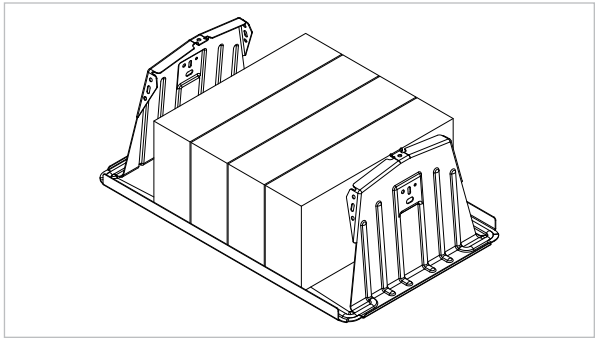
- VALLEY COLUMN SPACING
- EDGE VALLEY COLUMN SPACING
- EDGE E/W ROW SPACING
- E/W ROW SPACING
- RIDGE N/S COLUMN SPACING
- EDGE RIDGE N/S COLUMN SPACING



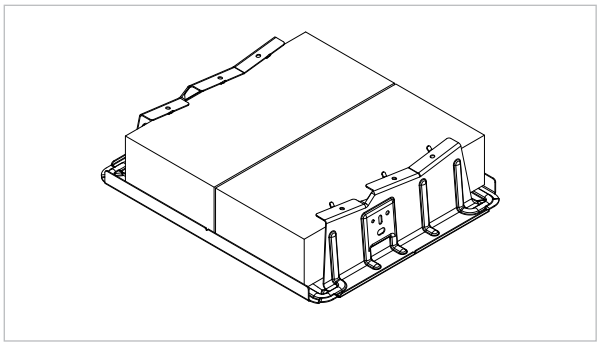
BALLAST BAY: The Ballast Bay is constructed of a high strength low alloy steel with a coating to protect against corrosion. This system has a modular design that allows for easy installation around roof obstructions and accommodates roof undulations. The Ballast Bays are designed to nest within each other to optimize shipping logistics. **NOTE: Systems installed on PVC roofs require ballast bays with pre-installed Santoprene pads.**



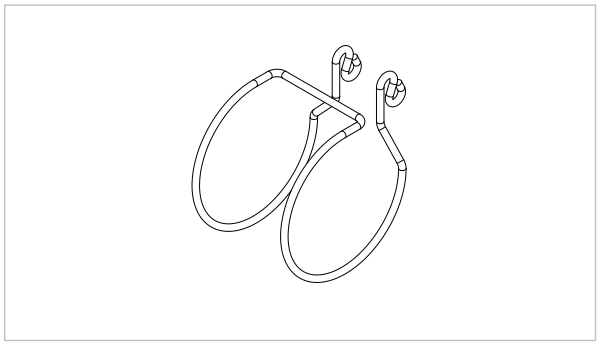
CLAMP & HARDWARE: The Module Clamp is made of Stainless Steel and can be used with module frame heights indicated on the clamp. The clamps are a portion of the UL2703 Listed system when installed according to this installation guide. A ¼-20 stainless steel bolt and u-nut are the associated hardware for installing clamps.



RIDGE BALLAST BLOCK: The Ridge ballast bay can fit up to 5 standard 4”x8”x16” solid concrete cap blocks. Block weight can range from 26 – 38 lbs and shall meet ASTM C1491 requirements for freeze thaw durability. Verify your block weights before using the Unirac U-builder online design tool

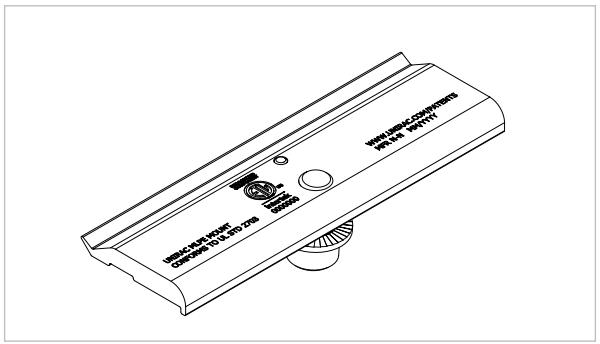


VALLEY BALLAST BLOCK: The Valley ballast bay can fit up to 2 standard 4”x8”x16” solid concrete cap blocks. Block weight can range from 26 – 38 lbs and shall meet ASTM C1491 requirements for freeze thaw durability. Verify your block weights before using the Unirac U-builder online design tool.



OPTIONAL WIRE MANAGEMENT: Custom Unirac wire clip along with mounting options for various off the shelf wire management clips.

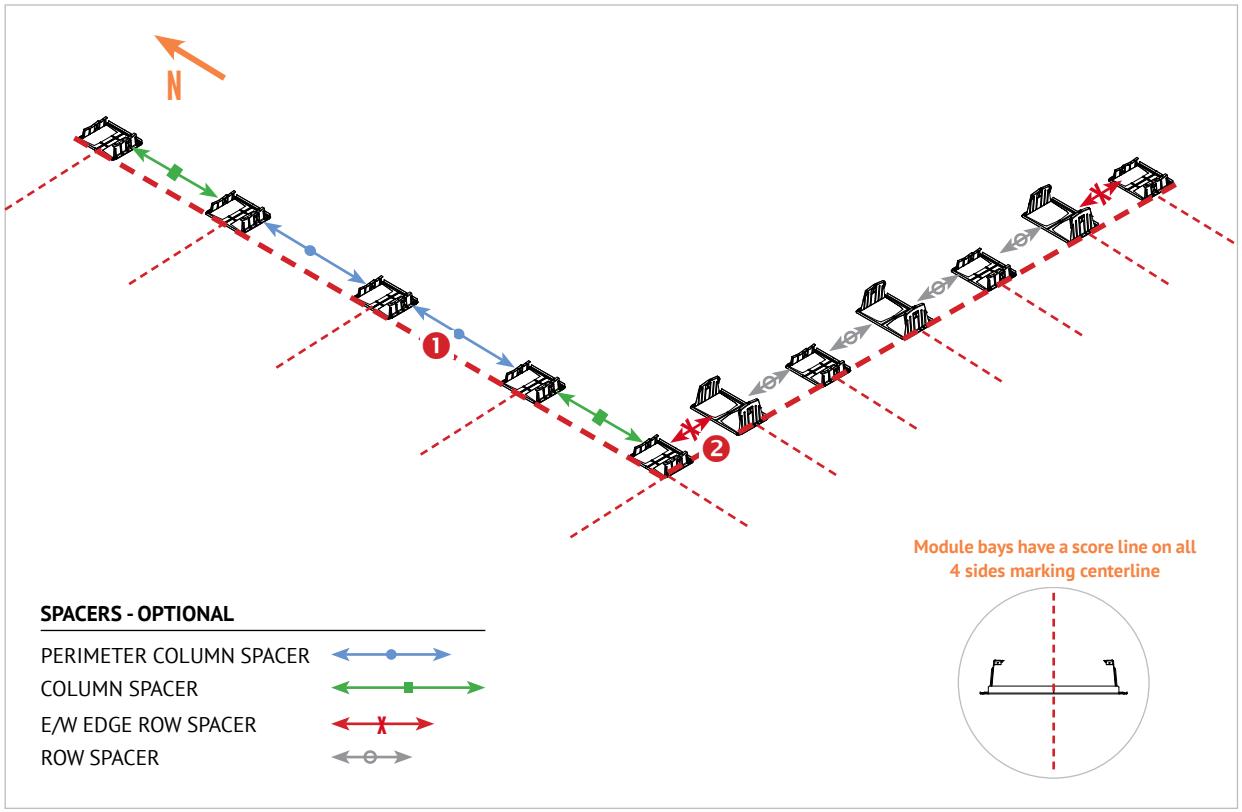
NOTE: All conduit and wire ways should be grounded & bonded per the (NEC) National Electric Code.

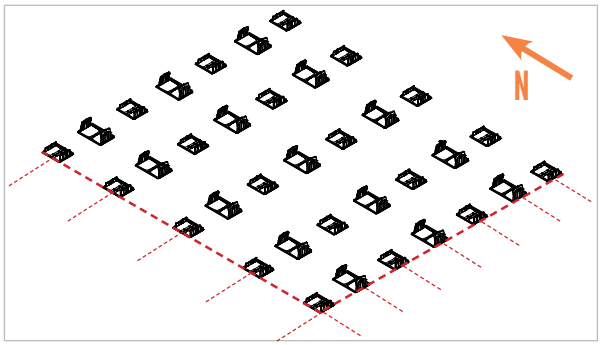


OPTIONAL MICROINVERTER MOUNTING: Microinverter / Power optimizer bracket, see page 10 for additional instructions.

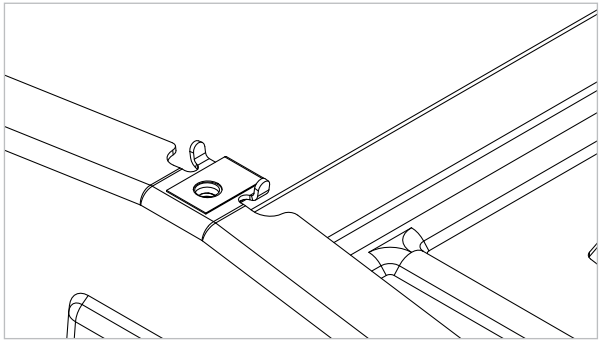
PART NUMBER DATA

S.No.	Part Number	Part Description
1	310801	RMDT RIDGE BAY
2	310802	RMDT VALLEY BAY
3	310804	RMDT RIDGE BAY, PVC
4	310805	RMDT VALLEY BAY, PVC
5	310823	RMDT MIDCLAMP 46-50MM
6	310824	RMDT MIDCLAMP 41-45MM
7	310825	RMDT MIDCLAMP 36-40MM
8	310826	RMDT MIDCLAMP 30-35MM
9	310820	RM5/DT ENDCLAMP 30-40MM
10	310821	RM5/DT ENDCLAMP 41-45MM
11	310822	RM5/DT ENDCLAMP 46-50MM
12	310850	RM5/DT WIRE MGMT CLIP
13	310851	RM5 WD WIRE MGMT CLIP
14	310860	RM5/DT 1/4-20 CLIP U-NUT SS18-8
15	310882	RM5/DT H-ATTACHMENT KIT
16	008114M	MLPE MOUNT ASSY
17	205000S	ENPHASE ENGAGE CABLE CLIP
18	008002S	GROUND WEEBLUG #1
19	008009P	ILSCO LAY IN LUG (GBL4DBT)
20	310999	FLASHLOC RM KIT





FILL IN BAYS



❶❷ SNAP WEST PERIMETER CHALK LINE, THEN NORTH OR SOUTH PERIMETER CHALK LINE. As best practice, mark lines on perimeter chalk lines to locate center of bays

PLACE WEST PERIMETER BAYS FIRST, THEN NORTH OR SOUTH PERIMETER BAYS. If slip sheets are required, place per manufacturer recommendations.

NOTE: Custom spacers can be made to aid in the placement of bays on the roof. See page 1

INSTALL U-NUT It is recommended to install u-nuts prior to placing ballast blocks & modules on the bays.

NOTE: U-NUT - Single Use Only - Do not re-torque once fully seated

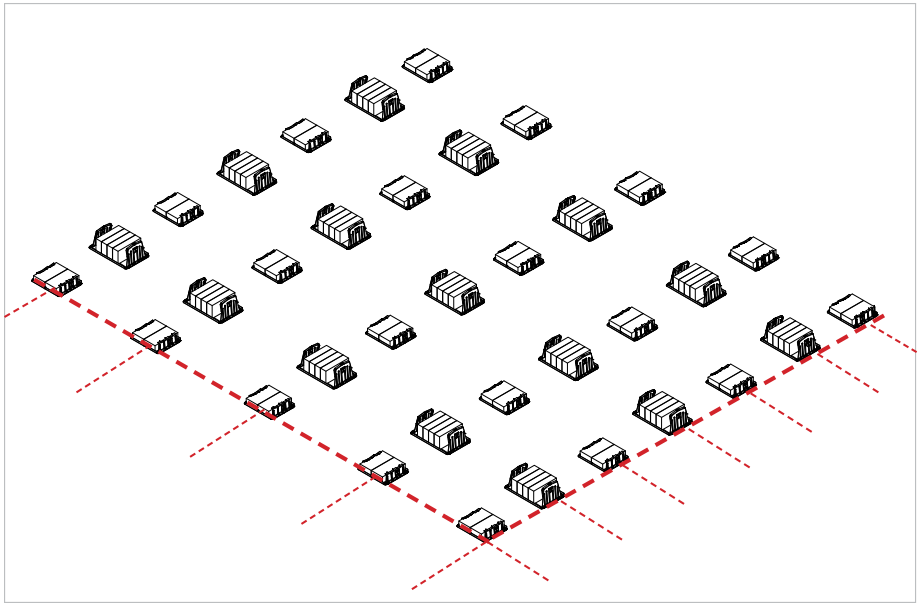
NOTE: If mechanical attachment is required, place prior to installation of modules.

RMDT

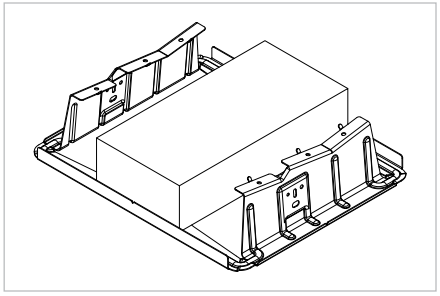
PLACE BALLAST

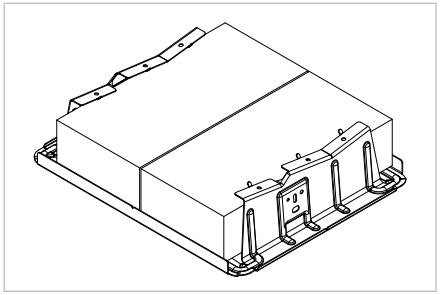
INSTALLATION GUIDE | PAGE 5

PLACE ALL BALLAST: A maximum of 2 ballasts can be placed in valley bay, and up to 5 ballasts can be placed in the ridge. Site specific ballast calculations should be created for each individual project in accordance with the U-Builder design software. This system has been rated for the mechanical load provisions of UL2703. In addition, it has been designed and tested to comply with the more rigorous requirements of SEAOC PV1, PV2 and ASCE 7.

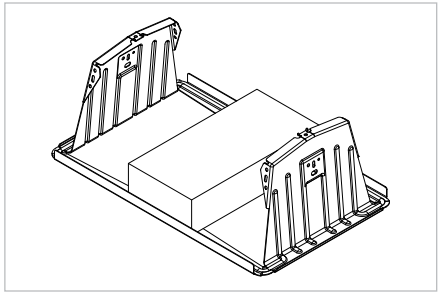


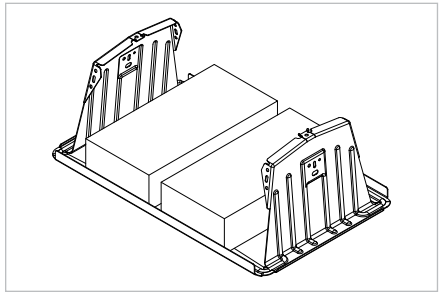
VALLEY BALLAST BLOCK OPTIONS:

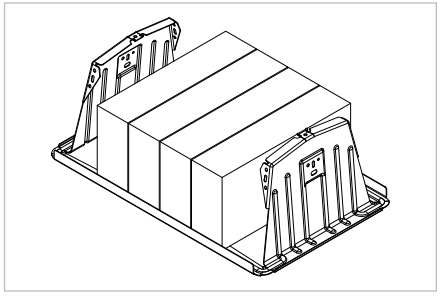


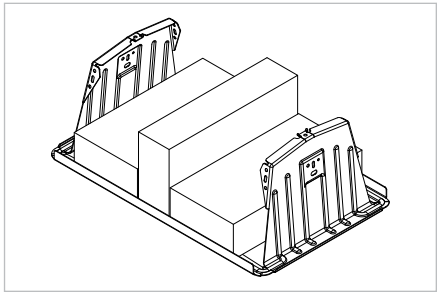


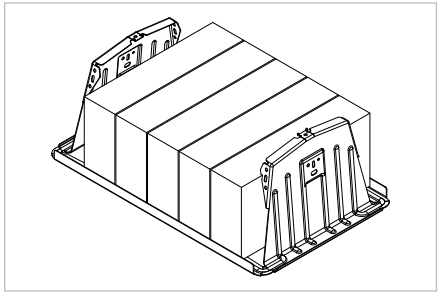
RIDGE BALLAST BLOCK OPTIONS:

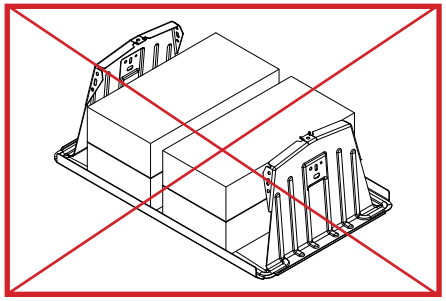


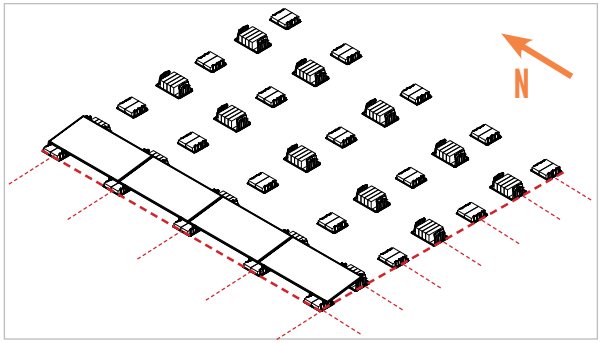






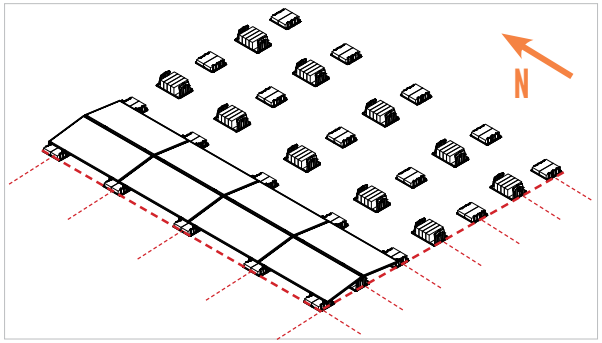






WESTERN EDGE MODULE PLACEMENT. Tabs on valley and ridge bay provide mechanical stop and aid in proper spacing at ridge. Rows of modules must be wired together at this time. See page 8 for wire management options.

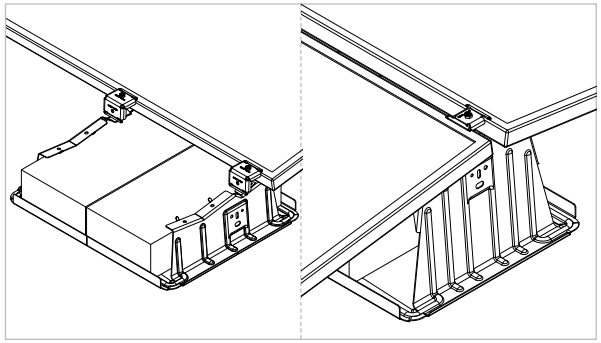
NOTE: Modules may be placed on bays without immediate installation of clamps. Column Spacing: 1 inch maximum gap between modules / ¼ inch minimum gap between modules.



EAST OR WEST EDGE MODULE PLACEMENT. Rows of modules must be wired together at this time. See page 8 for wire management options.

NOTE: Clamps should be installed for each East/West pair of rows after wiring has been completed.

NOTE: Wiring, wire management, and electrical QC should be done as each row is built.

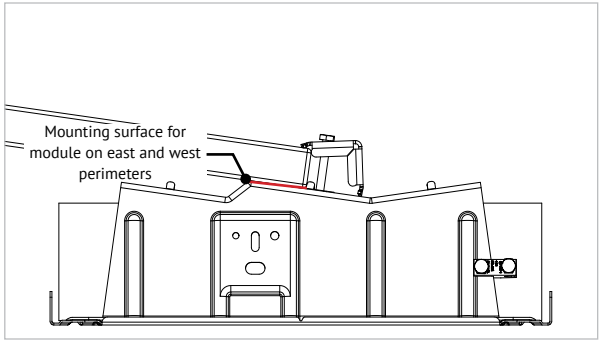


INSTALL CLAMPS

NOTE: U-NUT - Single Use Only - Do not re-torque once fully seated

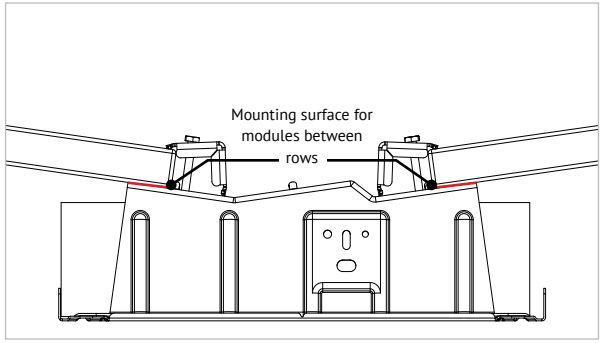
NOTE: CLAMP AND BOLT - Single Use Only - Do not re-torque once fully seated

TORQUE VALUE: 7FT-LBS to achieve UL2703 required clamp load



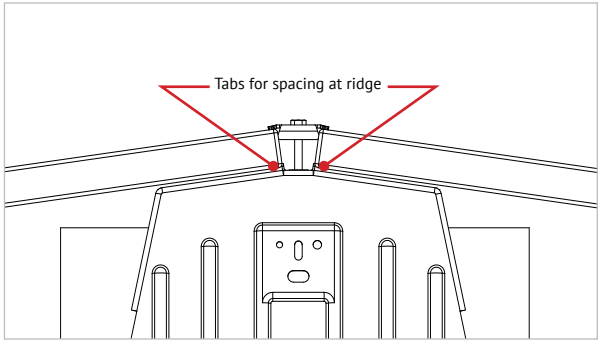
PROPER VALLEY BAY ORIENTATION AT EAST AND WEST PERIMETERS:

- Valley bays are designed to tuck up underneath the modules for east and west perimeters
- Bent tabs on all mounting surfaces act as a mechanical stop for the modules



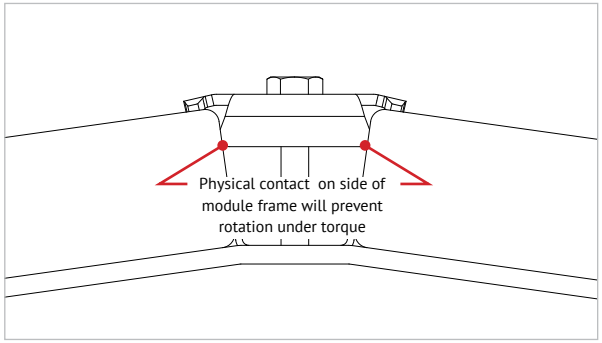
PROPER INTER-ROW SPACING:

- Inter row spacing at the valley is designed to provide an 8" space for walkways
- Bent tabs on all mounting surfaces act as a mechanical stop for the modules



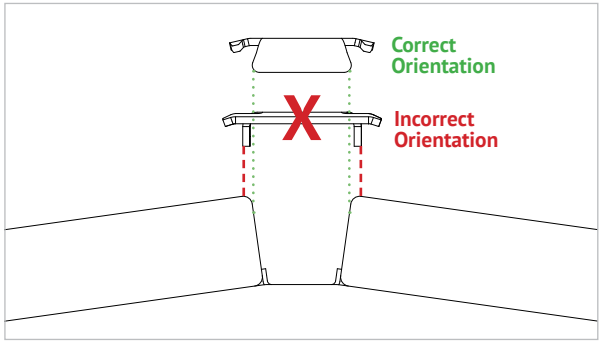
CLOSE UP MOUNTING AT RIDGE:

- Bent tabs on the mounting surfaces aid in setting the correct gap between modules at the ridge

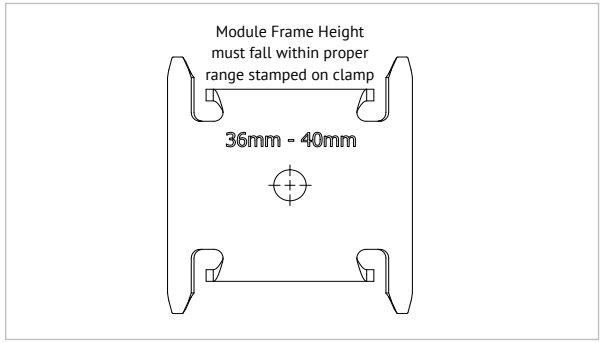


PROPER MID CLAMP INSTALLATION

- The top of the clamp is stamped for module frame height.
- Clamp should be firmly held against module frame while being torqued.

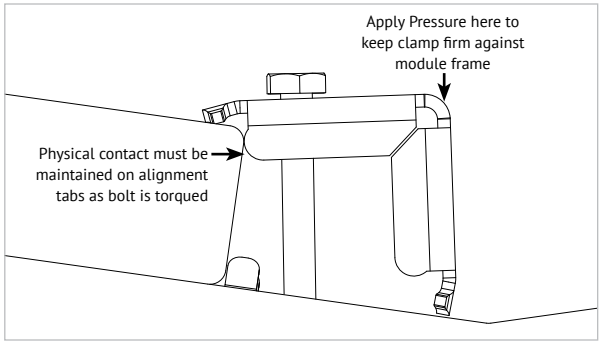


PROBLEM – CLAMP NOT ORIENTED CORRECTLY



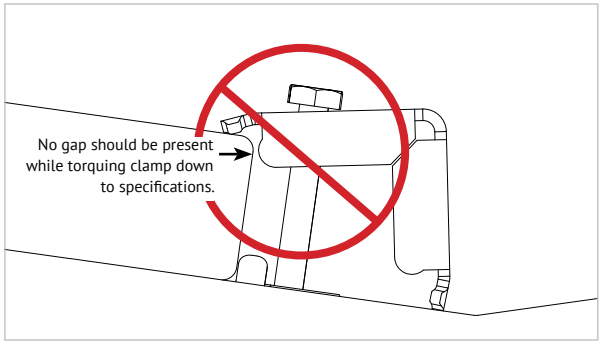
PROBLEM – NOT USING PROPER SIZE OF CLAMP FOR MODULE FRAME HEIGHT

- Double check the stamping on clamp to use the correct leg of clamp for module frame height
- The module height shall fall within the range shown on the top of the clamp



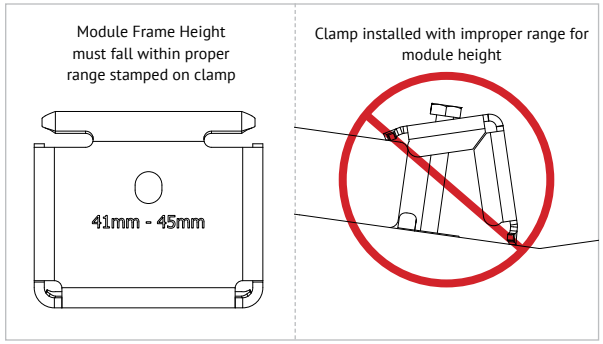
PROPER CLAMP INSTALLATION:

- Clamp is stamped for module frame height on each leg
- Clamp should be firmly held against module frame while being torqued



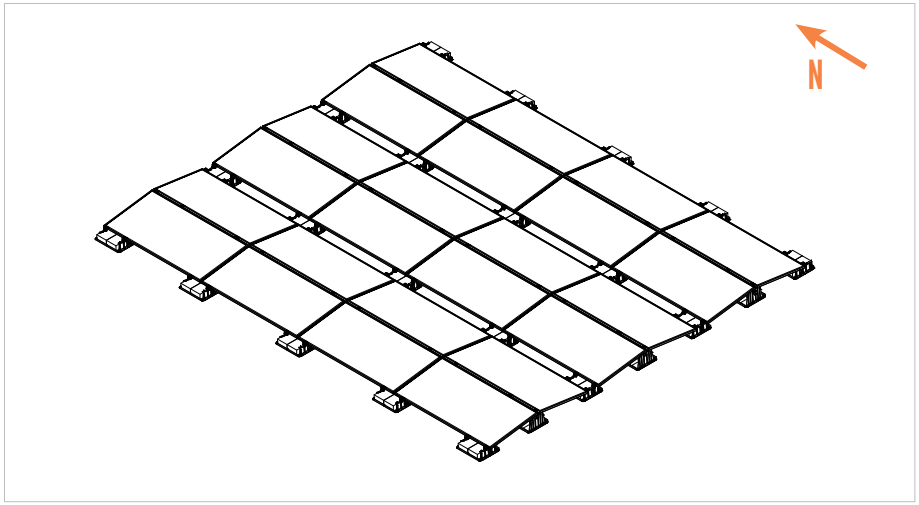
PROBLEM – CLAMP NOT SEATED AGAINST MODULE DURING TORQUING

- Clamp needs to be held securely against the module frame during torquing for proper installation

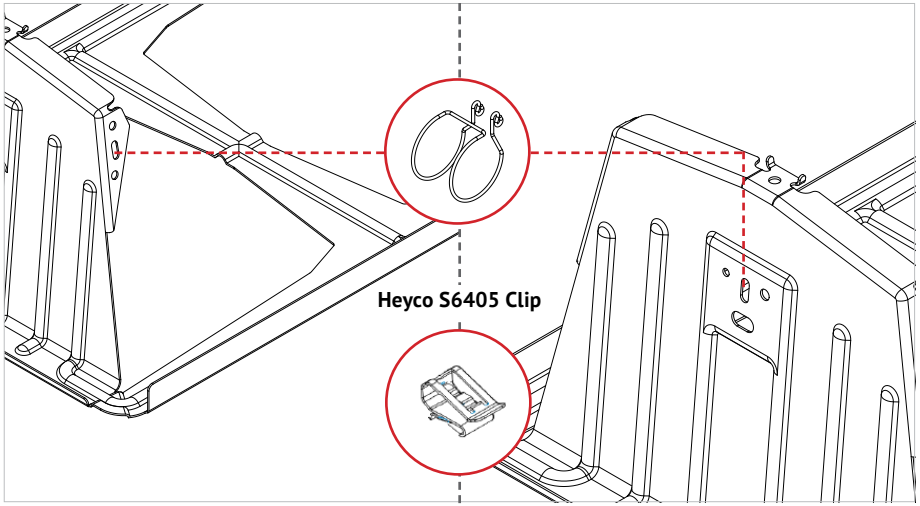


PROBLEM – NOT USING PROPER SIZE OF CLAMP FOR MODULE FRAME HEIGHT

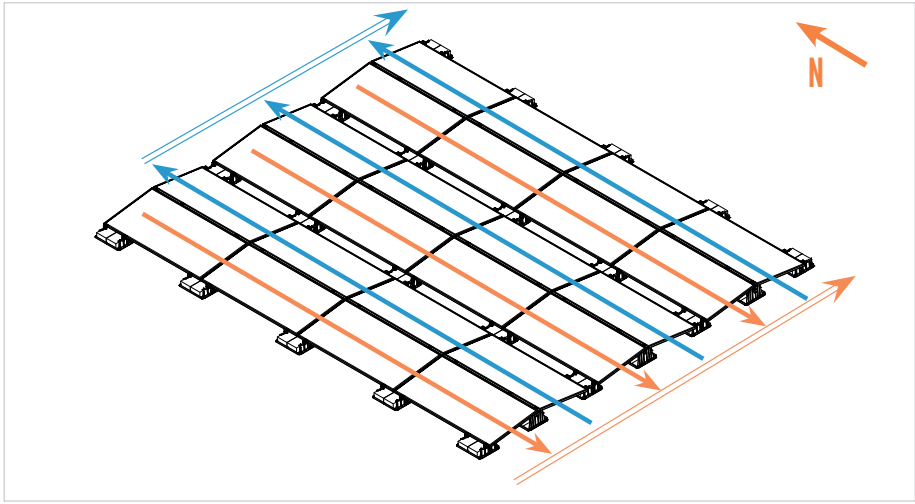
- Double check the stamping on clamp to use the correct leg of clamp for module frame height
- The module height shall fall within the range shown on the top of the clamp
- Excessive angle on clamp will inhibit required clamp load on module



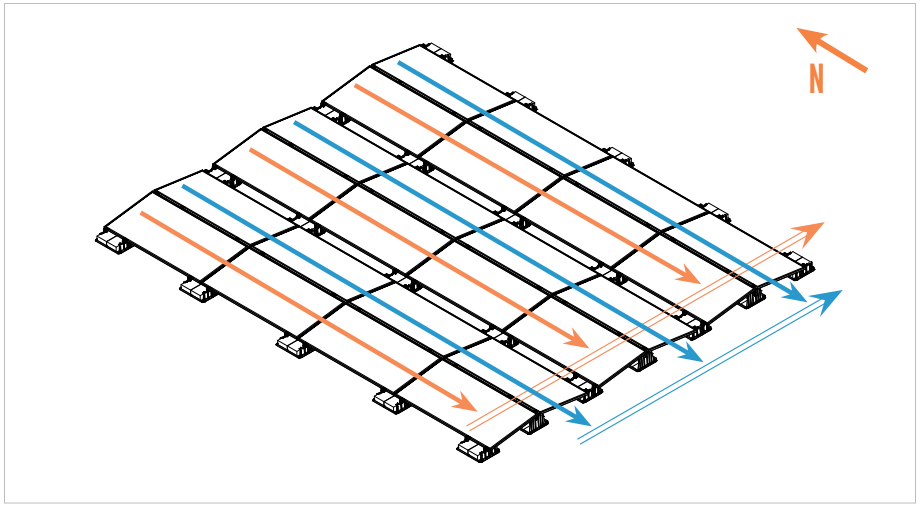
FILL IN ALL MODULES. Wire each row as modules are installed, and secure the modules in place after each east/west row pair is complete.



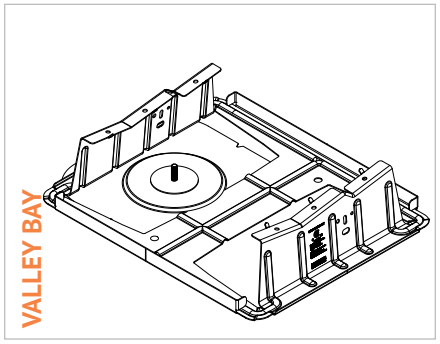
WIRE MANAGEMENT: Unirac provides a custom clip for wire management. Additional holes are included in the bay to accommodate other off the shelf wire management clips.



WIRE MANAGEMENT OPTION 1: Wire and bundle all east facing modules, run east facing bundle down north perimeter (or south perimeter) and vice versa for all west facing modules

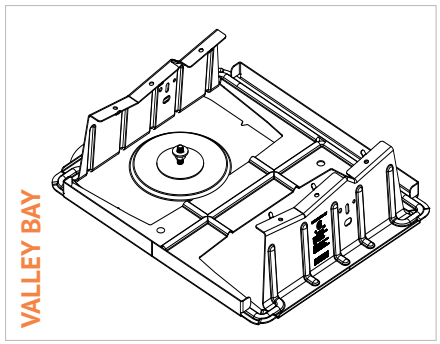


WIRE MANAGEMENT OPTION 2: Wire and bundle all east facing modules, wire and bundle all west facing modules. Run bundles along north or south perimeter

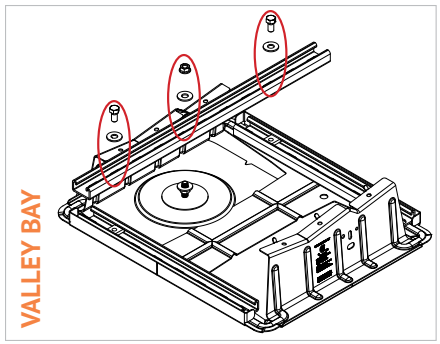


STEP 1 - POSITION U-ANCHOR: Position U-Anchor under bay requiring attachment and install according to manufacturer installation instructions.

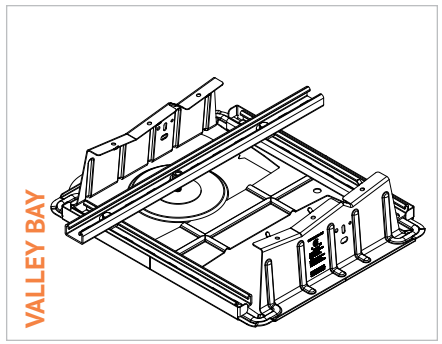
NOTE: Position attachment so that it is close to center of the bay as possible.



PLACE NUT AND WASHER: Include the nut and washer on the anchor stud prior to placing the stud through the strut.

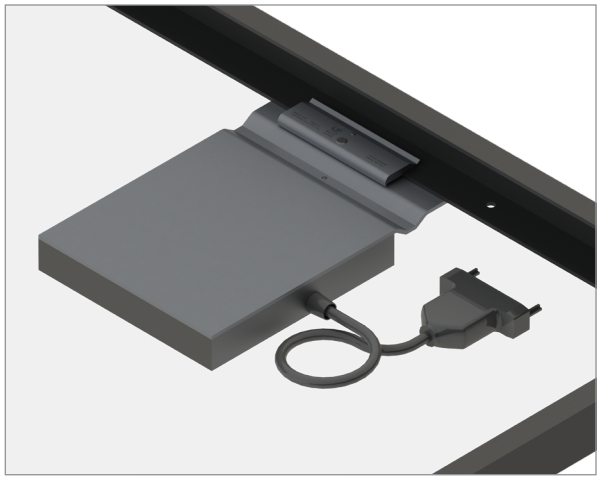


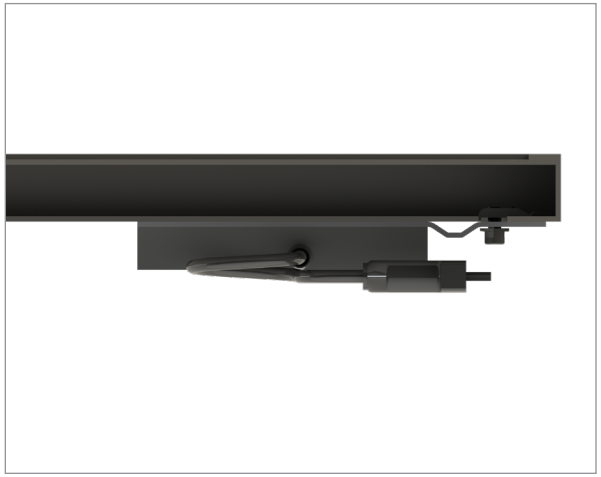
STEP - 3 PLACE H-STRUT: Position H-strut sections on bay as pictured above. Align the cross-strut with the anchor's stud. Connect side strut sections to cross strut using a strutnut, bolt, and washer as pictured.



STEP 4 - SECURE H-STRUT TO U-ANCHOR: Place 3/8" washer and 3/8-16 serrated flange nut on anchor stud, serrations facing down and tighten to 30 ft-lb.

TORQUE VALUE: 30FT-LBS

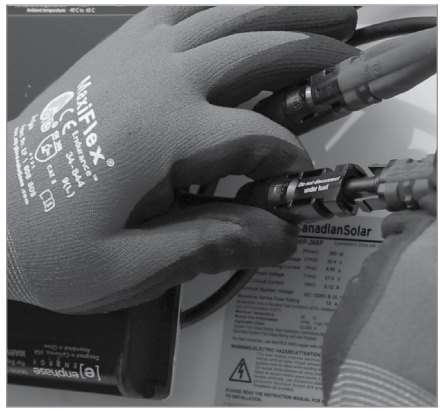




PRE-INSTALL MICROINVERTERS: Install MLPE in a location on the module that will not interfere with ballast bays or grounding lugs. To use trunk cable most efficiently, install MLPE components in the same locations on all modules in the same row.
TORQUE VALUE: 20FT-LBS









GROUNDING LUG MOUNTING DETAILS AS REQUIRED BY CODE & ENGINEER OF RECORD: The Ilsco lug has a green colored set screw for grounding indication purposes. One lug is recommended per continuous array, not to exceed 150ft X 150ft.

Unirac ROOFMOUNT is intended to be used with PV modules that have a system voltage less than or equal to that allowable by the National Electric Code (NEC). It is the installer's responsibility to check adherence to local codes.

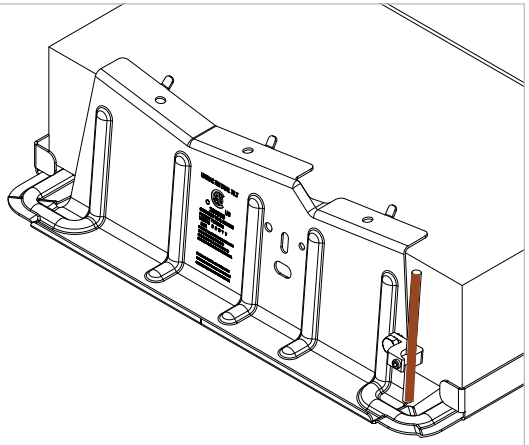
NOTE: The installation must be conducted in accordance with the National Electric Code ANSI / NFPA 70.

Ground Lug	Bolt Size	Torque Value
Ilsco Lug SGB-4	1/4"-20	6.5 ft-lbs (75 in-lbs)
Ilsco Lug GBL-4	#10-32	2.9 ft-lbs (35 in-lbs)
Wiley 6.7	1/4"-20	10 ft-lbs (120 in-lbs)

NOTE: In order to prevent corrosion induced by dissimilar metals, it is important to verify that the bare copper wire does not come into contact with aluminum or galvanized steel. These materials must be kept separate.

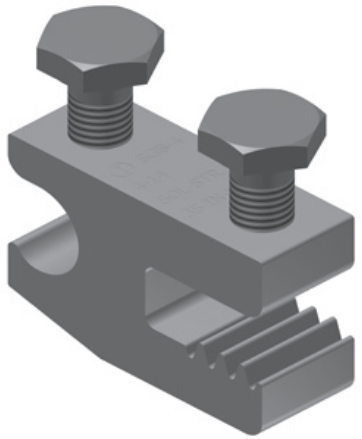
Although conformance with UL2703 was demonstrated without the use of oxide inhibitor material, it is recommended by Ilsco to provide an optimized bonding solution for their lay-in lug.

Ilsco GBL-4 Solar Grounding & Bonding



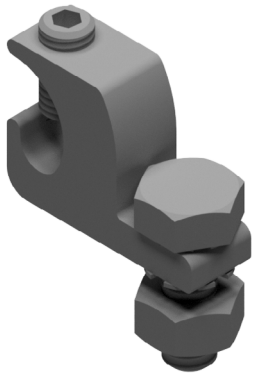
GROUNDING NOTE:
Can be installed on any location with a flat surface on the bay in order to ground the system.

Ilsco SGB-4 Solar Grounding & Bonding



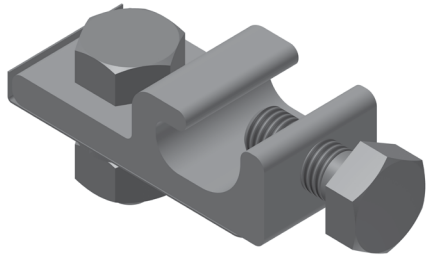
TERMINAL TORQUE:
Install conductor and torque to the following: 4-14 AWG: 35 in-lbs

Ilsco GBL-4 Solar Grounding & Bonding



TERMINAL TORQUE:
Install Conductor and torque to the following:
4-6 AWG: 35 in-lbs, 8AWG: 25 in-lbs

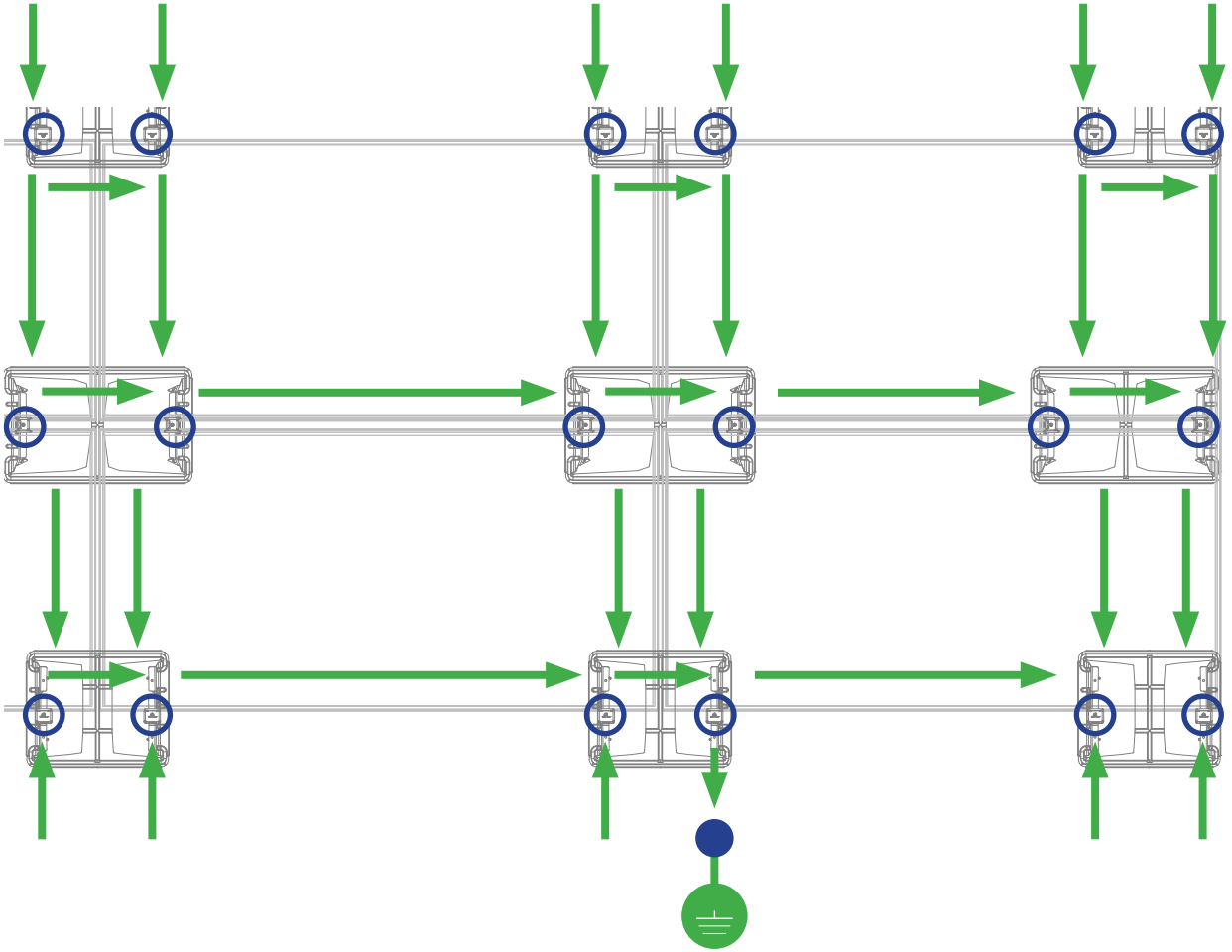
Wiley WEEB-Lug 6.7 Solar Grounding & Bonding



TERMINAL TORQUE:
Install Conductor and torque to the following:
4-6 AWG: 10 ft-lbs, 6-14 AWG: 7 ft-lbs

Note:
In order to avoid the need for utilizing bonding jumpers during maintenance or module removal do not attach the groung lug to a:

1. **valley bay with less than two modules**
2. **ridge bay with less than three modules**



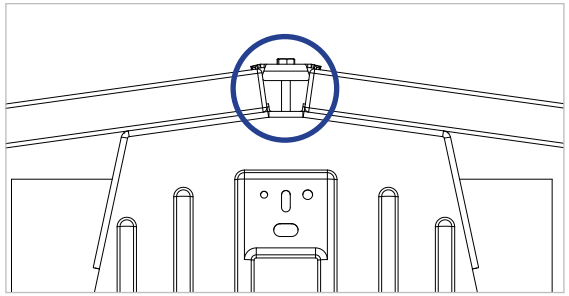
Fault Current Ground Path

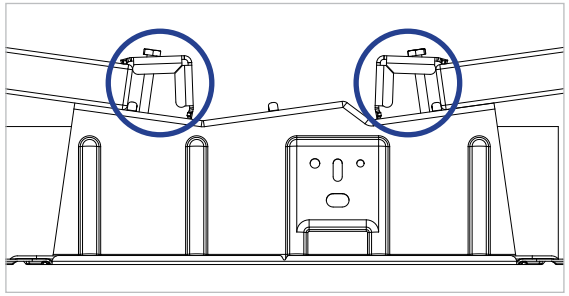
Ground Lug

Grounding Clip & Bolt

Min. 10 AWG Copper Wire

Module Frame
Module Bay w/ Grounding Clips



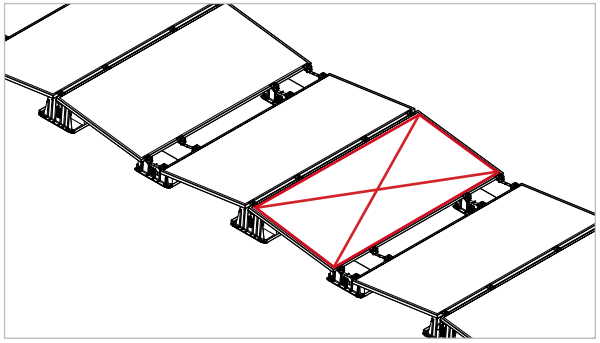


TEMPORARY GROUNDING & BONDING PROCEDURE: Periodic inspections should be conducted on the PV array to ensure there are not loose components, loose fasteners or corrosion. If any of the above items are found, the affected components are to be immediately replaced.

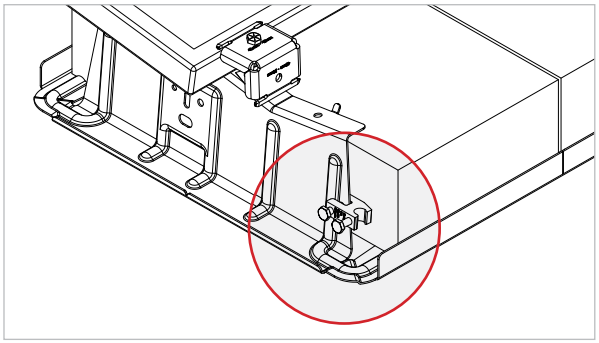
NOTE:

- **If a module must be removed or replaced, a temporary bonding jumper must be used to ensure safety of the personnel and PV system.**
- **Removing a PV module from a system is not considered to be routine maintenance. This type of activity should only be performed by trained and qualified installers.**
- **In order to prevent corrosion induced by dissimilar metals, it is important to verify that the bare copper wire does not come into contact with aluminum or galvanized steel. These materials must be kept separate.**

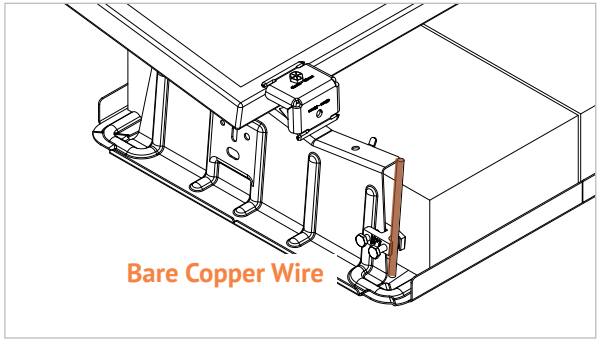
APPROVED LUGS and Terminal Torque see page 11



BONDING JUMPER REQUIRED: One example of a module removal that will require the use of a bonding jumper

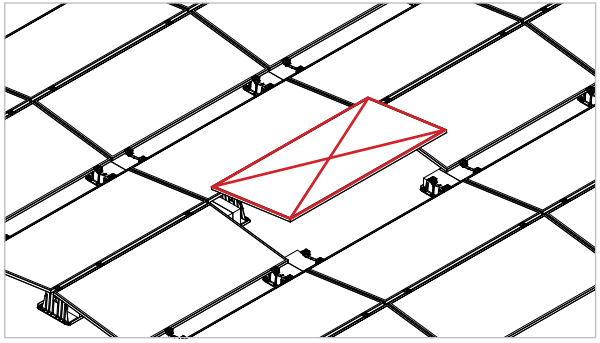


ATTACH LUGS: Use approved lug(s) to install on adjacent bays where the module is being removed.



INSERT COPPER WIRE: Insert bare copper wire into each lug, providing a bonding jumper across the missing module location.

Remove module & reverse the operation after maintenance is complete



BONDING JUMPER NOT REQUIRED, due to integrated bonding/grounding path throughout module frames/ bays around this location.

NOTE: CLAMP AND BOLT - Single Use Only - Use new clamps after any module replacements or system maintenance.

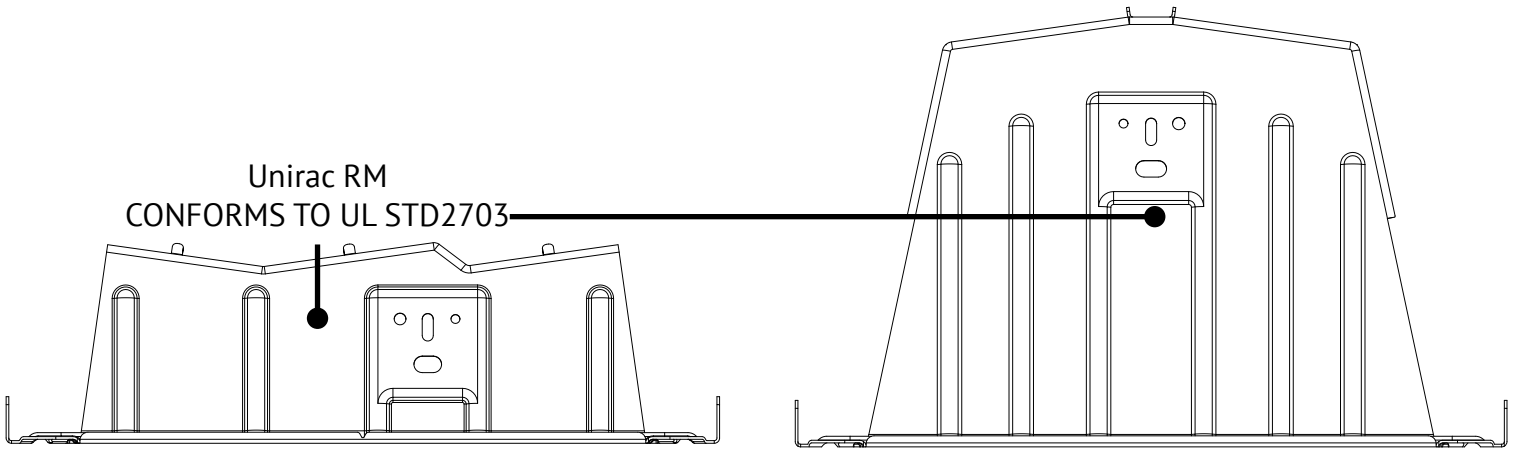
SYSTEM LEVEL FIRE CLASSIFICATION: The system fire class rating is only valid when the installation is conducted in accordance with the assembly instructions contained in this manual. RM ROOFMOUNT has been classified to the system level fire portion of UL2703. It has achieved Class A performance for low sloped roofs when used in conjunction with type 1, 2, 29 and 30 module constructions. Please see the specific conditions below for mounting details required to maintain the Class A fire rating. Minimum and maximum roof slopes are restricted through the system design and layout rules. The fire classification rating is only valid on roof pitches less than 2:12 (slopes < 2 inches per foot, or 9.5 degrees).

NOTE: Type 1, 2, 29, and 30 information is generally located on back of modules or through manufacturers documentation. Some building codes and fire codes require minimum clearances around such installations, and the installer should check local building code requirements for compliance.

Module Type	System level Fire Rating	Mitigation
Type 1	Class A	None Required / No Limitations
Type 2	Class A	None Required / No Limitations
Type 29	Class A	None Required / No Limitations
Type 30	Class A	None Required / No Limitations

TYPE 1, 2, 29, and 30 CLASS A FIRE RATING MOUNTING ORIENTATION

Unirac RM Dual tilt has achieved Class A system level fire performance for type 1 and type 2 module constructions. There are no provisions necessary in order to meet Class A requirements for this product.



MECHANICAL LOAD TEST

The Unirac RM system has been tested to the mechanical load provisions of UL2703 and covers the following basic parameter(s):

- Test Loads = 1.5 x Design Loads
- PV modules may have a reduced load rating, independent of the RM5 load rating. Please consult the PV module manufacturer's installation guide for more information.

TESTED MODULES

Module Manufacturer	Model / Series	Area (sq ft)	Standard Installation Configuration - No Mid Bay		Installed with Additional Bay at Modules North/South Center	
			Up Design Load (psf)	Down Design Load (psf)	Up Design Load (psf)	Down Design Load (psf)
Jinko	JKMxxxM-72HL4-V	27.8	17.24	36.20	Not Tested	Not Tested
Canadian Solar	CS7N-xxxMB-AG	33.4	15.67	14.85	23.52	33.33

NOTE:
All installation configurations have achieved a minimum of 5psf design load in the downslope direction.

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

Manufacture	Module Model / Series
Aionrise	AION60G1, AION72G1
Aleo	P18 & P19 S18, S19, S59, & S79
AMPS	AMPS-xxxN-108BB AMPS-xxxP-54BB
Aptos Solar	DNA-108-(MF/BF)10-xxxW DNA-108-MFN10-xxxW DNA-120-(MF/BF)10-xxxW DNA-120-(MF/BF)26 DNA-120-MF10 DNA-144-(MF/BF)26 DNA-144-BF10-xxxW-DG
Astronergy	ASM6612P Series CHSM6610(P/M)/HV CHSM6612(P/M)/HV CHSM66M(DG)/F-BH CHSM72(P/M)-HC CHSM72M(DG)/F-BH CHSM72M(DG)/F-BH (Fire Type 29 only) CHSM72N(DG)/F-BH (Fire Type 29 only)
AU Optronics	PM Series
Auxin	AXN10Mxxx AXN6M610T AXN6M612T AXN6P610T AXN6P612T AXNG1M SERIES
Axitec	AC-xxx(M/P)/(60/72)(S/V) AC-xxxMBT/144V AC-xxxP/156-60S AC-xxxTGB/144TS AXIblackpremium X HC: AC-xxxMH/(120/144)(SB/VB) AXIblackpremium XL HC: AC-xxxMH/120(SB/VB) AXIpremium X HC: AC-xxxMH/(120/144)(S/V)

Manufacture	Module Model / Series
Axitec(cont.)	AXIpremium XL HC: AC-xxxMH/120(S/V) AC-xxxTGB/144WS-US AC-xxxTGB/96BB AC-xxxTGB/108BB
Bila Solar	AA550US-6x24GG
Bluesun Solar	BSMxxxM10-72HBD
Boviet Solar	BVM6610 BVM6610M-xxxS-H-HC BVM6610M-xxxS-H-HC-BF BVM6612 BVM6612M-XXXS-H-HC-BF-DG BVM7612M-H-HC-BF-DG
BYD	P6K Series, MHK
Canadian Solar	CS1(K/H/U/Y)-MS CS3(U/K)-MB-AG CS3K-(MB/MS/P/PB) CS3L-(P/MS) CS3N-MS CS3U-(MB/MS/P/PB/PB-AG) CS3W-(MB-AG/MS/P/P-PB-AG) CS3Y-MB-AG CS5A-M CS6.1-60TM-H CS6.1-72TB-H CS6.2-66TB-xxxH CS6K-(M/MS/P) CS6P-(M/P) CS6R-MS CS6R-xxxMS-HL CS6U-(M/P) CS6V-M CS6W-(MB-AG/MS) CS6W-xxx-TB-AG CS6X-P, CS7L-MB-AG CS6.1-54TM-H

Manufacture	Module Model / Series
Canadian Solar(Cont.)	CS7L-MB-AG CS7L-TB-AG CS7L-xxxMB-AG CS7N-xxxMB-AG CS7N-xxx MS CS7N-xxxTB-AG ELPS CS6(P/A)-MM CS6.2-48TM-xxxH CS6.2-66TB-xxxHR
Centrosolar America	C-Series E-Series
CertainTeed	CT54M10XXX-N07 CT72M10XXX-N07 CTM10400HC11-06 CTM10400HC11-08 CTM10400HC11-09 CTTCxxxHC12-08 CTxxxHC11-06 CTxxxMxx-(01/02/03/04) CTxxxPxx-01
Eco Solargy	Orion 1000 & Apollo 1000
EMMVEE	ExxxHCBT144-T Titanium Clear
Energy America	ZLK-xxx
Es Foundry	ES-DN8-H54B-xxx ES-DN8-H72-xxx ES-DP8-H54B-xxx ES-DP8-H72-xxx
ET Solar	ETAC & ET Modules ET-M672BHxxxTW ET-M772BH520-550WW/WB ET-M772BHxxxTW/TB

- 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

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Manufacture	Module Model / Series
ET Solar (Cont.)	ET-N772TBHxxxGL
Fellow Energy	FE72-18X(ND)
Flextronics	FXS
Freedom Forever	FF-MP-BBB-xxx FF-MP1-BBB-xxx
FreeVolt	PVGraf
GCL	GCL-P6 & GCL-M6 Series
Gstar Solar	GSD7S54T-xxxBT GSP7G54M(H)
Hansol	TD-AN3, TD-AN4, UD-AN1 & UB-AN1
Hanwha SolarOne	HSL 60 & HSL 72
Heliene	132HC M10 SL Monofacial Module 144HC M10 NTYP SL Bifacial Module 144HC M10 SL Bifacial 144HC M6 156HC M10 NTYP SL Bifacial Module 156HC M10 SL Bifacial 36M, 60M, 60P, 72M & 72P Series
HT-SAAE	HT60-156M-C, HT60-156M(V)-C, HT72-166M HT72-18X HT72-156(M/P), HT72-156P-C, HT72-156P(V)-C HT72-18X(ND)-F
Hyperion Solar	HY-DH108P8(B) HY-DH108N8B HY-DH144P8 HY-DH156N8 HY-DH156P8
Hyundai	HiN-SxxxXG(BK) HiN-TxxxNF(BK) HiN-TxxxNI

Manufacture	Module Model / Series
Hyundai (Cont.)	HiN-TxxxNJ HiN-TxxxOJ HiS-SxxxOJ HiS-SxxxXG(BK) HiS-SxxxYH(BK) HiS-TxxxNJ
Hyundai Heavy Industries	MG, TG, RG, KG, MI, RI, KI, HI & TI Series HiA-SxxxHG, HiD-SxxxRG(BK), HiS-S400PI
Illuminate USA	IL5-72HBD-xxx M IL8-66HGD-xxx M
Imperial Star	ISM7-SHDD108-400/M
INDEPWR Solar	iPWR-M10-54BX2S-xxxW iPWR-M10-60BX2S-xxxW
Inxeption	mSolar 108BB HC Series (TXI10-xxx108BB) mSolar 144BB HC Series (TXS6-xxx144BB)
ITEK	iT, iT-HE & iT-SE Series
Japan Solar	JPS-60 & JPS-72 Series
JA Solar	JAM54S30 xxx/MR JAM54S31 xxx/MR JAM66D45 LB JAM72D10 xxx/MB JAM72D30MB JAM78D10MB JAM72S30 /MR JAM72D40 xxx/MB JAM72S30 /MR JAP6-60, JAM6-60 JAP6-72, JAM6-72 JAP6(k)-60-xxx/4BB, JAP60S##-xxx/** JAM6(k)-60-xxx/**, JAM60S##-xxx/** JAP6(k)-72-xxx/4BB, JAP72S##-xxx/** JAM6(k)-72-xxx/**, JAM72S##-xxx/**

Manufacture	Module Model / Series
JA Solar (Cont.)	i. ##: 01, 02, 03, 09, 10 ii. **: SC, PR, BP, HiT, IB, MW, MR ** = Backsheet, ## Cell technology
Jinko Solar	JKMxxxM-72L-V, JKMxxxM-72HL(4)-V JKMxxxM-7RL3-TV JKMxxxM-7RL3-V, JKMxxxM-72HBL-V JKMxxxN-54HL4-B JKMxxxN-72HL4-BDV (30mm & 35mm Frame Height) JKMxxxN-72HL4-BDX JKMxxxN-72HL4-TV JKMxxxPP-60B, JKMxxxM-60 K07(A/B) JKMSxxx(P/PP)-60, JKMSxxxPP-60B-J4 JKMSxxx-72, JKMSxxx(P/PP)-72 JKMSxxxM-60 JKMxxx(M/PP)-72-V, JKMxxxPP-72(Plus) JKMxxx(M/P/PP)-72, JKMxxx-72L-V JKMxxx(P/PP)-60, JKMxxxPP-60(Plus) JKMxxx(P/PP)-72B JKMxxxM-60(B/L/HL/BL/LV) JJKMxxxM-60-V, JKMxxxPP-60B-J4 JKMxxxM-6RL3-B JKMxxxM-72HL4-TV JKMxxxM-72HLM-TV
Kyocera	KD-F Series
LA Solar	BLA Model LSxxxBF LSxxxBL LSxxxBL (410 watt) LSxxxHC LSxxxHC (430-450 watt range)

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Manufacture	Module Model / Series
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 LGxxxN2T-B5, LGxxxN1K-B6 LGxxx(N1C/N1K/N2T/N2W)-E6 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/HIB/HPH/HIH) LR4-72(HPH/HIH), LR5-54-HPB-xxxM LR4-72HBD xxxM LR5-54HABB-xxx M (fire type 29 only) LR5-54HPB-xxx M LR5-54-HPB-xxxM LR5-54HTB xxxM LR5-72HBD xxx M LR6-60, LR6-60(BK/PE/PB/PH/HPB/HIB/HPH/HIH) LR6-72, LR6-72(BK/HV/PE/PB/PH/HPH/HIH) LR7-72HGD-xxx M LR8-54HGBB LR8-66HGD-xxx M
Maxeon	SPR-MAX3-xxx-COM SPR-MAX3-XXX-R SPR-MAX3-XXX-BLK-R SPR-MAX6-xxx SPR-MAX6-xxx-BLK
Meyer Burger	Meyer Burger Black Meyer Burger White Meyer Burger Glass
Mission Solar Energy	MSExxxSX5K MSExxxSX5T MSH10-xxxHN4G-DC11

Manufacture	Module Model / Series
Mission Solar Energy(Cont.)	MSE MONO MSE PERC MSExxx(SR8T/SR8K/SR9S/SX5T/SX5K/SX6W) MSExxxHT0B MSExxxSX6Z MSExxxSX9R MSH10-xxxHN4G MSH10-xxxHT4T MSI10-xxxHN4G MSI10-xxxHT4G MSI10-xxxHT4T MSN10xxxHT4T MSX10-xxxHN0B MSExxxSX9Z
Mitrex	Mxxx-L3H Mxxx-I3H
Mitsubishi	MJE & MLE Series
mSolar	TXI10-xxx108BB
Neo Solar Power Co.	D6M Series
NE Solar	NESE xxx-60MH-M6 NESE xxx 66MHB-G12 NESE xxx-66THB-G12R NESE xxx-72MHB-M10 NESE xxx 72MHT-M10 NESE xxx 72THB-M10 NESE xxx 72MHB-M10
Optivolt	OPT10MxxxB
Panasonic	VBHNxxxSA(15/16) VBHNxxxKA(01/02) VBHNxxxSA17(G/E) & SA18(E) VBHNxxxKA(03/04) EVPVxxx EVPVxxx(H/K/PK/HK/HK2)

Manufacture	Module Model / Series
Peimar	SGxxxM (FB/BF) SMxxxM
Philadelphia Solar	PS-M108(HCBF)-400W (30 & 35mm frames) PS-M144(HCBF)-xxxW PS-MNB108(HCBF)-xxxW PS-MNB144(HCBF)-xxxW PS-MNB156(HCBF)-xxxW
Phono Solar	PSxxxM4(H)-24/TH PSxxxM8GFH-24TNH
Phono Solar Tech.	Standard Modules
Prism Solar	P72 Series P72X-xxx
Q Cells	B.LINE (PLUS/PRO) BFR G4.1 B.LINE PEAK DUO (G7/G7.2) B.LINE PEAK DUO L-(G5/G5.1/G5.2/G5.3) B.LINE PEAK DUO L-(G7/G7.1/G7.2/G7.3) B.LINE PLUS/PRO - L G4.x Q.PEAK DUO (BLK) 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 (G7/G7.2) Q.PEAK DUO BLK ML-G10.a+ Q.PEAK DUO BLK-G10(+) Q.PEAK DUO BLK G10+ /AC Q.PEAK DUO BLK-G6+/TS Q.PEAK DUO BLK ML-G10+/AC Q.PEAK DUO BLK ML-G10.B+ Q.PEAK DUO BLK ML-G10.C+ Q.PEAK DUO BLK ML-G10.C1+/AC Q.PEAK DUO BLK ML-G10+ / t Q.PEAK DUO BLK ML-G10+ / TS

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Manufacture	Module Model / Series
Q Cells (cont.)	Q.PEAK DUO G10+ Q.PEAK DUO L-(G5/G5.1/G5.2/G5.3) Q.PEAK DUO L-(G6/6.2/6.3) Q.PEAK DUO L-(G7/G7.1/G7.2/G7.3/G7.7) Q.PEAK DUO L-(G8/G8.1/G8.2/G8.3/G8.3 BFG) Q.PEAK DUO L-G6.3 / BFG Q.PEAK DUO ML-G12S.3 / BFG Q.PEAK DUO ML-G12S.3/BFG Q.PEAK DUO ML-G12S.7/BFG Q.TRON BLK M-G2(.H1)(.F1)(.C1)+/AC QPEAK DUO G10.C1+ AC Q.PEAK DUO ML-G12S.d / BFG Q.PEAK DUO XL-(G10/G10.2/G10.3/G10.c/G10.d) Q.PEAK DUO XL-G10.3/BFG Q.PEAK DUO XL-(G11.2/G11.3) Q.PEAK DUO XL (G9/G9.2/G9.3) Q.PEAK DUO XL-G10.d/BFG Q.PEAK DUO XL-G11S Q.PEAK DUO XL-G11.3/BFG Q.PLUS L-G4.2/TAA Q.PLUS/PEAK/PRO - L G4.x Q. PLUS/PRO G3, Q.PLUS BFR G3.1, Q.PRO/PLUS G4 Q.PRO BFR G4x, Q.PEAK (BLK) G4.1 (TAA/MAX) Q.PRO EC-G4.4 Q.PRO L-G2, Q.PEAK (BLK) (G3/G3.1) Q.TRON BLK M-G2+ Q.TRON BLK M-G2+ AC Q.TRON BLK M-G2.F+ Q.TRON BLK M-G2.F1+/AC Q.TRON BLK M-G2.H+ Q.TRON BLK M-G2.H1+/AC Q.TRON BLK M-G2+ SERIES Q.TRON M-G2+ SERIES Q.TRON ML-G3.3/BFG Q.TRON XL-G2.3 / BFG Q.TRON XL-G2.3 / BFG

Manufacture	Module Model / Series
Q Cells (Cont.)	Q.PEAK DUO BLK ML-G10.XY+/AC (where “X” = any letter between A to W, where “Y” = any number between 1 to 9.)
Qcells	Q.PEAK DUO BLK ML-G10.D+ Q.PEAK DUO BLK ML-G10.D1+/AC Q.PEAK DUO ML-G12S.P3 / BFG Q.PEAK DUO XL-G11S.3 / BFG Q.PEAK DUO XL-G11S.B3 / BFG Q.PEAK DUO XL-G11S.L3 / BFG Q.TRON BLK M-G2+/AC Q.TRON BLK M-G2.C+ Q.TRON BLK M-G2.C1+/AC Q.TRON BLK M-G2.C3+/AC Q.TRON BLK M-G2.C4+/AC Q.TRON BLK M-G2.D+ Q.TRON BLK M-G2.D1+/AC Q.TRON BLK M-G2.D2+/AC Q.TRON BLK M-G2.Y+
REC	PEAK & ECO RECxxxAA (BLK/Pure/Pure-R/ Pure-RX/ Pure 2/ Pro M) RECxxxAA Pure-RX RECxxxAA PURE-RX-DC RECxxxNP (N-PEAK) RECxxxNP2 (Black) RECxxxNP3 Black RECxxxPE, RECxxxPE72 RECxxxTP RECxxxTP2(BLK2) RECxxxTP2S(B)(XV) RECxxxTP3M (Black) RECxxxTP4 (Black)

Manufacture	Module Model / Series
Regitec Solar	RMHT54/xxxAB2
Renesola	60 Cell Modules RS6-xxxNBG-E3 Vitrus2
Risen	RSM60-6, RSM72-6, RSM144-6 RSM110-8-xxxBMDG
Runergy	HY-DH132N11 HY-DH96N11B
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 SL40-60MAI/MBI/MCI-xxxV
Seraphim	SEG-(6PA/6PB/6MA/6MA-HV/6MB/E01/E11) SRP-(6QA/6QB) SRP-320-375-BMB-HV SRP-390-405-BMD-HV SRP-390-415-BMA-HV SRP-xxx-BMD-HV SRP-xxx-BTA-BG SRP-xxx-BTB-BG SRP-xxx-BTC-BG SRP-xxx-BTD-BG SRP-xxx-BTE-BG

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Manufacture	Module Model / Series
Sharp	ND-24CQCJ ND-25CQCS ND-F4Q300 ND-Q235F4 NU-SA
Sharp (Cont.)	NU-SC
Silfab	SILxxx(BG/BK/BL/HC/HC+/HL/HM/HN/ML/NL/NT/NX/NU/QD/QM) SIL-xxx XL SIL-xxx XM SIL-xxx XM+ SLA-M/P SLG-M/P
Sirius	ELNSM54M-HC-BF Series ELNSM54M-HC Series
Sirius PV	ELNSM54M-HC-N
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 SE-182*105-xxxM-96-BD
Solaria	PowerXTxxxR-PD/BD/AC PowerXTxxxC PowerXT-xxxR-PM (AC) PowerX-400R

Manufacture	Module Model / Series
Solar Space	SS8-54HDB-xxx-N SS8-54HD-xxx-N SS8-72HD-xxx-M SS8-72HD-xxx-N SS8-78HD-xxx-M SS9-66HD-xxx-N SSA-48HDB-xxx-N SSA-48HD-xxx-N SSA-54HDB-xxx-N SSA-54HD-xxx-N
Solar Space (Cont.)	SSA-66HD-xxx-N
SolarTech	STU HJT STU PERC
SolarWorld	Sunmodule Protect/Plus
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/ Flextronics	F-Series / FLEX FXS R-Series / FLEX FXS
Suniva	MV Series Optimus Series
Sunket Solar	SKT580M10-144S2
Sunmac Solar	M754SH-BB Series
SunPlus Optimum	SR4-54HTB-xxxM
SunPower	X-Series 72 & E-Series 72 X-Series 96 & E-Series 96 P-Series, Sig Black SPR E20 435 COM (G4 Frame) Axxx-BLK-G-AC, SPR-Mxxx-H-AC SPR-Mxxx-BLK-H-AC

Manufacture	Module Model / Series
Sunpro Power	SPDGxxx-120M12 SPDGxxx-N108M10 SPDGxxx-N144M10
SunTech	STP XXX STPXXXS - B60/Wnhb
Talesun	Hipor M Smart TD6I72M TD7G72M TM3G48M
	TM3G54M TM3G66M TM7G54M TM7G60M TM7G72M TP572, TP596, TP654, TP660 TP672 TP6F72M TP6F72M(H) TP7G54M(H)
Tesla	Tesla Solar Panel TSP-415/TSP-420 TxxxH TxxxS

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Manufacture	Module Model / Series
Thornova	TS-BBT54(xxx) TS-BG54 TS-BG72 TS-BGT72(xxx)
Trina Solar	DE06, DE09.05, DE09C.07 DE18M(II), DEG18MC.20(II) DE19, DEG19C.20 DEG15HC.20(II), DEG15MC.20(II), DEG15VC.20(II) PA05, PD05, DD05, DD06 PD14, PE14, DD14, DE14, DE15, DE15V(II) TSM-DE06X.05(II) TSM-DE09.05 TSM-DE09.08 TSM-DE09C.07
Trina Solar (Cont.)	TSM-DEG21C.20 TSM-NE09RC.05 TSM-NE09RH.05 TSM-NE19RC TSM-NEG19RC.20 TSM-NEG21C.20 TSM-DE15H(II)
Universal Solar	UNI4xx-144BMH-DG UNI5xx-144BMH-DG UNIxxx-108M-BB UNIxxx-120M-BB UNIxxx-120MH
Upsolar	UP-Mxxx

Manufacture	Module Model / Series
URE	D7K_H8A D7M_(H7A/H8A) FAKxxx(C8G/E8G) FAMxxxE7G-BB FAMxxxE8G(-BB) FBKxxxM8G
URECO	F6MxxxE7G-BB FBMxxxM7G-BB FBMxxxMFG-BB
Vikram Solar	Eldorado, Solivo & Somera PREXOS VSMDHT.60.AAA.05 PREXOS VSMDHT.72.AAA.05 Paradea VSMDH.72.AAA.05 Paradea VSMDH.66.AAA.05
VSUN	VSUN400-415-144BMH VSUN4xx-144BMH-DG VSUN5xx-144BMH-DG VSUNxxx-108BMH VSUNxxx-108M-BB VSUNxxx-108MH VSUNxxx-120BMH VSUNxxx-120M-BB VSUNxxx-132BMH VSUNxxx-144BMH VSUNxxx-144M-BB VSUNxxx-144M-BW VSUNxxx-144MH VSUNxxx-60M-BB

Manufacture	Module Model / Series
VSUN (Cont.)	VSUNxxx-72MH VSUNxxxN-108BMH-BB VSUNxxxN-108BMH-BB (SoftPaw) VSUNxxxN-108BMH-DG-BB VSUNxxxN-120BMH-BB (SoftPaw) VSUNxxxN-132BMHR VSUNxxxN-144BMH VSUNxxxN-144MH
Waaree	Arka Series WSMDi Bi-55-xxx BiN-08-xxx WST & WSP Series
Yingli	YGE 60 Cell YGE 60 Cell Series 2 YLM 60 YLM 72 YLM-VG
Yotta Energy	YSM-B450-1
ZNShine Solar	ZXM6-72 Series ZXM6-NH120 Series ZXM6-NH144 ZXM6-NHLDD144-XXX/M ZXM7-SH108 Series ZXM7-SHDB144 ZXM7-SHLDD144 ZXM7-UHLDD108 ZXM7-UHLDD144 ZXM8-GPLDD132 Series ZXM8-TPLDD132

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