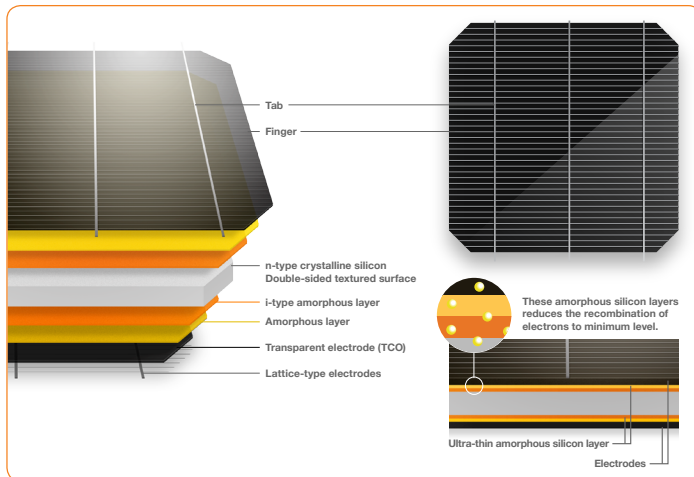
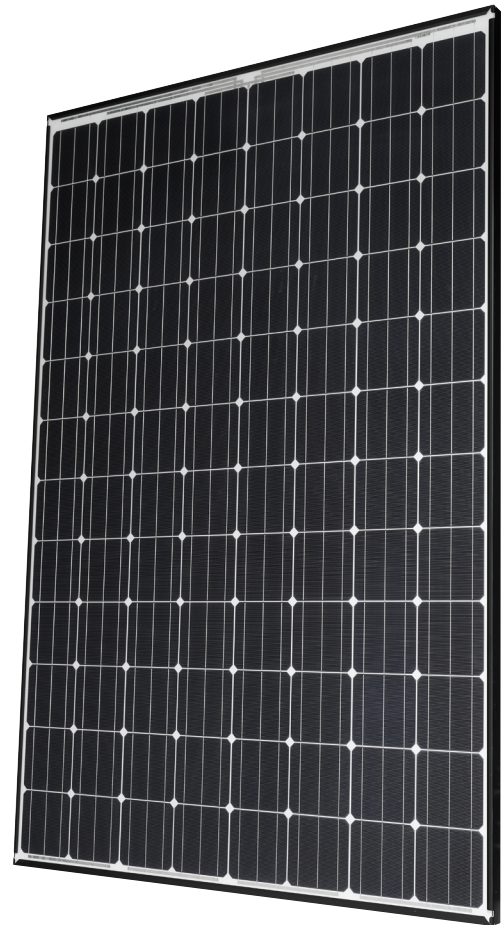
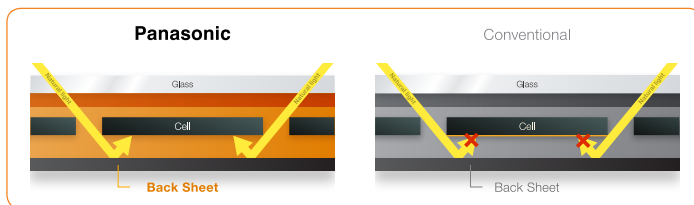


# N330/N325

Panasonic's unique heterojunction technology uses ultra-thin amorphous silicon layers. These thin dual layers reduce losses, resulting in higher energy output than conventional panels.



Advanced bifacial cell designed for increased energy output. The cell utilizes sunlight reflected back from the rear side material which captures more light and converted into energy.



## Our competitive advantages



### High Efficiency at High Temperatures

As temperature increases, HIT® continues to perform at high levels due to the industry leading temperature coefficient of  $-0.258\% / ^\circ\text{C}$ . No other module even comes close to our temperature characteristics. That means more energy throughout the day.



### 25 Year Product and Performance Warranty\*\*

Industry leading 25 year product workmanship and performance warranty is backed by a century old company- Panasonic. Power output is guaranteed to 90.76% after 25 years, far greater than other companies.



### Quality and Reliability

Panasonic's vertical integration, 20 years of experience manufacturing HIT® and 20 internal tests beyond those mandated by current standards provides extreme quality assurance.



### Higher Efficiency 19.7%

Enables higher power output and greater energy yields. HIT® provides maximum production for your limited roof space.



### Low Degradation

HIT "N-type" cells result in extremely Low Light Induced Degradation (LID) and zero Potential Induced Degradation (PID) which supports reliability and longevity. This technology reduces annual degradation to 0.26% compare to 0.70% in conventional panels, guaranteeing more power for the long haul.



### Unique water drainage

The water drainage system give rain, water and snow melt a place to go, reducing water stains and soiling on the panel. Less dirt on the panel means more sunlight getting through to generate power.

**N330/N325**

**ELECTRICAL SPECIFICATIONS**

Model	VBHN330SA16	VBHN325SA16
Rated Power (Pmax) <sup>1</sup>	330W	325W
Maximum Power Voltage (Vpm)	58.0V	57.6V
Maximum Power Current (Ipm)	5.70A	5.65A
Open Circuit Voltage (Voc)	69.7V	69.6V
Short Circuit Current (Isc)	6.07A	6.03A
Temperature Coefficient (Pmax)	-0.258%/°C	-0.258%/°C
Temperature Coefficient (Voc)	-0.16V/°C	-0.16V/°C
Temperature Coefficient (Isc)	3.34mA/°C	3.32mA/°C
NOCT	44.0°C	44.0°C
CEC PTC Rating	311.3W	306.5W
Cell Efficiency	22.09%	21.76%
Module Efficiency	19.7%	19.4%
Watts per Ft. <sup>2</sup>	18.3W	18.0W
Maximum System Voltage	600V	600V
Series Fuse Rating	15A	15A
Warranted Tolerance (-/+)	+10%/-0%*	+10%/-0%*

**MECHANICAL SPECIFICATIONS**

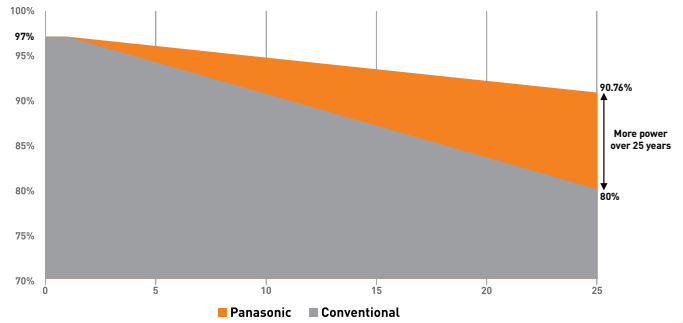
Model	VBHN330SA16, VBHN325SA16
Internal Bypass Diodes	4 Bypass Diodes
Module Area	18.02 Ft. <sup>2</sup> (1.67m <sup>2</sup> )
Weight	40.81 Lbs. (18.5kg)
Dimensions LxWxH	62.6x41.5x1.4 in. (1590x1053x35 mm)
Cable Length +Male/-Female	40.2/40.2 in. (1020/1020 mm)
Cable Size / Type	No. 12 AWG / PV Cable
Connector Type <sup>2</sup>	Multi-Contact <sup>®</sup> Type IV (MC4™)
Static Wind / Snow Load	50 PSF (2400 Pa)
Pallet Dimensions LxWxH	63.7x42.2x65.4 in.
Quantity per Pallet / Pallet Weight	40 pcs. /1719 Lbs. (780 kg)
Quantity per 40' Container	560 pcs.
Quantity per 20' Container	240 pcs.

**OPERATING CONDITIONS & SAFETY RATINGS**

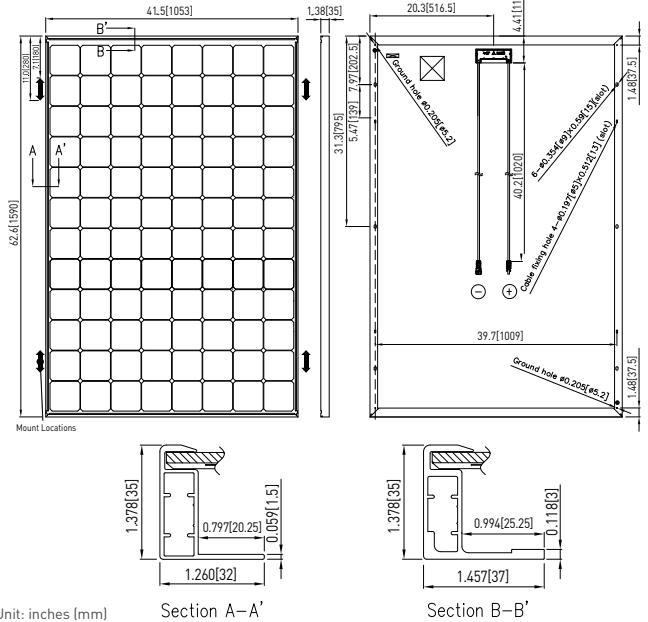
Model	VBHN330SA16, VBHN325SA16
Operating Temperature	-40°F to 185°F (-40°C to 85°C)
Hail Safety Impact Velocity	1" hailstone (25mm) at 52 mph (23m/s)
Safety & Rating Certifications	UL 1703, cUL, CEC
UL 1703 Fire Classification	Type 2
Limited Warranty	25** Yrs Workmanship and Power Output (Linear)**

**NOTE:** Standard Test Conditions: Air mass 1.5; irradiance = 1000W/m<sup>2</sup>; cell temp. 25°C  
 \* Maximum power at delivery. For guarantee conditions, please check our guarantee document.  
 \*\* Installation need to be registered through our website [www.panasonicusahitwarranty.com](http://www.panasonicusahitwarranty.com) within 60 days in order to receive twenty-five (25) year Product workmanship. Otherwise, Product Workmanship will be only fifteen (15) years.  
 \*\*\* 1st year 97%, after 2nd year 0.26% annual degradation to year 25.  
<sup>1</sup> STC: Cell temp. 25°C, AM1.5, 1000W/m<sup>2</sup>  
<sup>2</sup> Safety locking clip (PV-SSH4) is not supplied with the module.  
**NOTE:** Specifications and information above may change without notice.

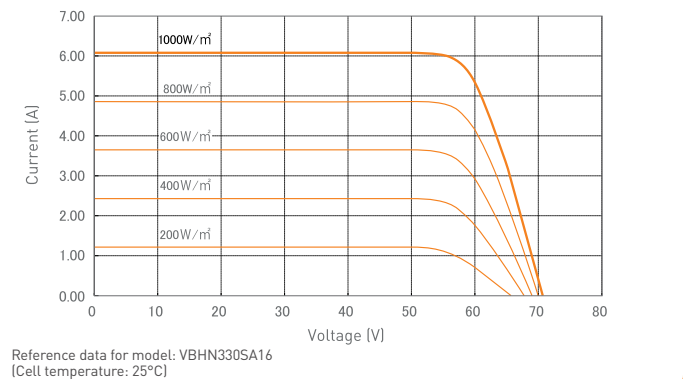
**PERFORMANCE WARRANTY**



**DIMENSIONS**



**DEPENDENCE ON IRRADIANCE**



**CAUTION!** Please read the installation manual carefully before using the products.  
 Used electrical and electronic products must not be mixed with general household waste. For proper treatment, recovery and recycling of old products, please take them to applicable collection points in accordance with your national legislation.



# SolarEdge Power Optimizer

Module Add-On For North America

P300 / P320 / P370 / P400 / P405



POWER OPTIMIZER

## PV power optimization at the module-level

- Up to 25% more energy
- Superior efficiency (99.5%)
- Mitigates all types of module mismatch losses, from manufacturing tolerance to partial shading
- Flexible system design for maximum space utilization
- Fast installation with a single bolt
- Next generation maintenance with module-level monitoring
- Module-level voltage shutdown for installer and firefighter safety



# SolarEdge Power Optimizer

Module Add-On for North America

P300 / P320 / P370 / P400 / P405

	P300 (for 60-cell modules)	P320 (for high-power 60-cell modules)	P370 (for higher-power 60 and 72-cell modules)	P400 (for 72 & 96-cell modules)	P405 (for thin film modules)	
<b>INPUT</b>						
Rated Input DC Power <sup>(1)</sup>	300	320	370	400	405	W
Absolute Maximum Input Voltage (Voc at lowest temperature)	48		60	80	125	Vdc
MPPT Operating Range	8 - 48		8 - 60	8 - 80	12.5 - 105	Vdc
Maximum Short Circuit Current (Isc)	10	11		10.1		Adc
Maximum DC Input Current	12.5	13.75		12.63		Adc
Maximum Efficiency				99.5		%
Weighted Efficiency				98.8		%
Overvoltage Category				II		
<b>OUTPUT DURING OPERATION (POWER OPTIMIZER CONNECTED TO OPERATING SOLAREEDGE INVERTER)</b>						
Maximum Output Current				15		Adc
Maximum Output Voltage	60			85		Vdc
<b>OUTPUT DURING STANDBY (POWER OPTIMIZER DISCONNECTED FROM SOLAREEDGE INVERTER OR SOLAREEDGE INVERTER OFF)</b>						
Safety Output Voltage per Power Optimizer				1		Vdc
<b>STANDARD COMPLIANCE</b>						
EMC	FCC Part15 Class B, IEC61000-6-2, IEC61000-6-3					
Safety	IEC62109-1 (class II safety), UL1741					
RoHS	Yes					
<b>INSTALLATION SPECIFICATIONS</b>						
Maximum Allowed System Voltage	1000					Vdc
Compatible inverters	All SolarEdge Single Phase and Three Phase inverters					
Dimensions (W x L x H)	128 x 152 x 27.5 / 5 x 5.97 x 1.08			128 x 152 x 35 / 5 x 5.97 x 1.37	128 x 152 x 50 / 5 x 5.97 x 1.96	mm / in
Weight (including cables)	630 / 1.4			750 / 1.7	845 / 1.9	gr / lb
Input Connector	MC4 Compatible		MC4 / Amphenol AH4	MC4 Compatible		
Output Wire Type / Connector	Double Insulated; MC4 Compatible		Double Insulated; MC4 / Amphenol AH4	Double Insulated; MC4 Compatible		
Output Wire Length	0.95 / 3.0		1.2 / 3.9		m / ft	
Operating Temperature Range	-40 - +85 / -40 - +185					°C / °F
Protection Rating	IP68 / NEMA6P					
Relative Humidity	0 - 100					%

<sup>(1)</sup> Rated STC power of the module. Module of up to +5% power tolerance allowed.

PV SYSTEM DESIGN USING A SOLAREEDGE INVERTER <sup>(2)(3)</sup>	SINGLE PHASE HD-WAVE	SINGLE PHASE	THREE PHASE 208V	THREE PHASE 480V	
Minimum String Length (Power Optimizers)	8		10	18	
Maximum String Length (Power Optimizers)	25		25	50	
Maximum Power per String	5700 (6000 with SE7600H-US)	5250	6000	12750	W
Parallel Strings of Different Lengths or Orientations	Yes				

<sup>(2)</sup> For detailed string sizing information refer to: [http://www.solaredge.com/sites/default/files/string\\_sizing\\_na.pdf](http://www.solaredge.com/sites/default/files/string_sizing_na.pdf).

<sup>(3)</sup> It is not allowed to mix P405 with P300/P370/P400/P600/P700 in one string.





## SolarEdge Single Phase Inverters

For North America

SE3000A-US / SE3800A-US / SE5000A-US / SE6000A-US /  
SE7600A-US / SE10000A-US / SE11400A-US



INVERTERS

### The best choice for SolarEdge enabled systems

- Integrated arc fault protection (Type 1) for NEC 2011 690.11 compliance
- Superior efficiency (98%)
- Small, lightweight and easy to install on provided bracket
- Built-in module-level monitoring
- Internet connection through Ethernet or Wireless
- Outdoor and indoor installation
- Fixed voltage inverter, DC/AC conversion only
- Pre-assembled Safety Switch for faster installation
- Optional – revenue grade data, ANSI C12.1



# Single Phase Inverters for North America

SE3000A-US / SE3800A-US / SE5000A-US / SE6000A-US /  
SE7600A-US / SE10000A-US / SE11400A-US

	SE3000A-US	SE3800A-US	SE5000A-US	SE6000A-US	SE7600A-US	SE10000A-US	SE11400A-US		
<b>OUTPUT</b>									
Nominal AC Power Output	3000	3800	5000	6000	7600	9980 @ 208V 10000 @ 240V	11400	VA	
Max. AC Power Output	3300	4150	5400 @ 208V 5450 @ 240V	6000	8350	10800 @ 208V 10950 @ 240V	12000	VA	
AC Output Voltage Min.-Nom.-Max. <sup>(1)</sup> 183 - 208 - 229 Vac	-	-	✓	-	-	✓	-		
AC Output Voltage Min.-Nom.-Max. <sup>(1)</sup> 211 - 240 - 264 Vac	✓	✓	✓	✓	✓	✓	✓		
AC Frequency Min.-Nom.-Max. <sup>(1)</sup>	59.3 - 60 - 60.5 (with HI country setting 57 - 60 - 60.5)							Hz	
Max. Continuous Output Current	12.5	16	24 @ 208V 21 @ 240V	25	32	48 @ 208V 42 @ 240V	47.5	A	
GFDI Threshold	1							A	
Utility Monitoring, Islanding Protection, Country Configurable Thresholds	Yes							Yes	
<b>INPUT</b>									
Maximum DC Power (STC)	4050	5100	6750	8100	10250	13500	15350	W	
Transformer-less, Ungrounded	Yes								
Max. Input Voltage	500							Vdc	
Nom. DC Input Voltage	325 @ 208V / 350 @ 240V							Vdc	
Max. Input Current <sup>(2)</sup>	9.5	13	16.5 @ 208V 15.5 @ 240V	18	23	33 @ 208V 30.5 @ 240V	34.5	Adc	
Max. Input Short Circuit Current	45							Adc	
Reverse-Polarity Protection	Yes								
Ground-Fault Isolation Detection	600k $\Omega$ Sensitivity								
Maximum Inverter Efficiency	97.7	98.2	98.3	98.3	98	98	98	%	
CEC Weighted Efficiency	97.5	98	97.5 @ 208V 98 @ 240V	97.5	97.5	97 @ 208V 97.5 @ 240V	97.5	%	
Nighttime Power Consumption	< 2.5							< 4	W
<b>ADDITIONAL FEATURES</b>									
Supported Communication Interfaces	RS485, RS232, Ethernet, ZigBee (optional)								
Revenue Grade Data, ANSI C12.1	Optional <sup>(3)</sup>								
Rapid Shutdown – NEC 2014 690.12	Functionality enabled when SolarEdge rapid shutdown kit is installed <sup>(4)</sup>								
<b>STANDARD COMPLIANCE</b>									
Safety	UL1741, UL1699B, UL1998, CSA 22.2								
Grid Connection Standards	IEEE1547								
Emissions	FCC part15 class B								
<b>INSTALLATION SPECIFICATIONS</b>									
AC output conduit size / AWG range	3/4" minimum / 16-6 AWG					3/4" minimum / 8-3 AWG			
DC input conduit size / # of strings / AWG range	3/4" minimum / 1-2 strings / 16-6 AWG					3/4" minimum / 1-2 strings / 14-6 AWG			
Dimensions with Safety Switch (HxWxD)	30.5 x 12.5 x 7.2 / 775 x 315 x 184					30.5 x 12.5 x 10.5 / 775 x 315 x 260			
Weight with Safety Switch	51.2 / 23.2		54.7 / 24.7			88.4 / 40.1		in / mm lb / kg	
Cooling	Natural Convection				Natural convection and internal fan (user replaceable)	Fans (user replaceable)			
Noise	< 25					< 50			
Min.-Max. Operating Temperature Range	-13 to +140 / -25 to +60 (-40 to +60 version available <sup>(5)</sup> )							°F / °C	
Protection Rating	NEMA 3R								

<sup>(1)</sup> For other regional settings please contact SolarEdge support.

<sup>(2)</sup> A higher current source may be used; the inverter will limit its input current to the values stated.

<sup>(3)</sup> Revenue grade inverter P/N: SExxxxA-US000NNR2 (for 7600W inverter:SE7600A-US002NNR2).

<sup>(4)</sup> Rapid shutdown kit P/N: SE1000-RSD-S1.

<sup>(5)</sup> -40 version P/N: SExxxxA-US000NNU4 (for 7600W inverter:SE7600A-US002NNU4).



# RoHS

# EcoFoot5D™

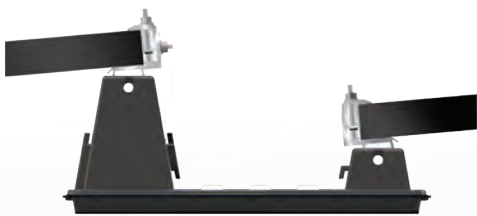
The New High Density 5° Racking System

## Small Footprint. Big Power.

Now you can build more powerful rooftop solar systems faster and easier than ever before with the new high density EcoFoot5D™ Racking System.



Built on the Industry-Preferred EcoFoot® Platform, with More than 200MW Installed.



### 18.4% More Power

Small 7"x16.7" roof-friendly modular Base and dense 9.9" inter-row spacing enables a tightly packed solar array that delivers 18.4% more power than 10° systems. Whether your roof is small or large, EcoFoot5D provides more power, lowering cost-per-watt.

### Elegantly Simple Installation

EcoFoot5D delivers preassembled parts and an out-of-the-box, ready-to-go installation that is unlike any other flat-roof racking. The result is a seamless installation process from start to finish, saving on time and minimizing job-site impact.

### Cost-Saving Logistics & Support

Stackable bases enable a huge per-pallet shipping capacity. Fewer pallets are required, minimizing shipping, storage and onsite crane use. Dedicated engineering support prevents issues before they happen and provides quick solutions if obstacles arise.



Ecolibrium Solar

Contact: 740.249.1877 | sales@ecolibrumsolar.com | www.ecolibrumsolar.com

# The Simplest Way to



Built on the Industry Preferred, Innovative EcoFoot Modular Platform.

## Creating Unbeatable Solar Racking for Commercial and Residential

Since 2010, Ecolibrium Solar has revolutionized Solar Racking with the FAST & SIMPLE EcoFoot Modular Platform for flat-roof arrays and EcoX Rail-less Racking for pitched roofs. With 600MW installed on flat and pitched roofs nationwide, we bring the beauty of simplicity to solar.

## Elegant Installation, Right Out of the Box.

### Organized Work Flow and Preassembled Parts

When you're on the roof, you need ready-to-go components and a simple install. That's why installers prefer the EcoFoot Modular Platform: Bases self-align and parts are preassembled so no PV panel preparation is required, which enables non-stop installation from box to roof.

### Only with EcoFoot Modular

Now, EcoFoot5D delivers the elegant installation process only EcoFoot modular systems provide and packs the array with 18.4% more power than a 10° system.

Installer-centric design provides unsurpassed advantages:

- Simple, preassembled parts
- Self-aligning Bases fall in line as modules are placed
- Low-effort roof layout, just two chalk lines required
- No PV panel prep, non-stop install from box to roof
- Six simple installation steps
- No training required – 5-minute learning curve

## 290kW of Bases Delivered on 1 Standard Pallet.

### Efficient Logistics On and Off the Roof Increase Your Bottom Line

From shipping to deployment, the EcoFoot5D System reduces your shipping, storage and roof-loading needs significantly. The result? More profit per job.

- Stackable Bases and low part count streamline logistics
- 290kW of Bases delivered on 1 standard pallet
- Small footprint minimizes contact with roof
- Slip sheet costs are low, drainage is excellent
- Lightweight and roof-friendly
- Ideal for residential and commercial flat roofs
- Suited for mild or extreme roof undulations



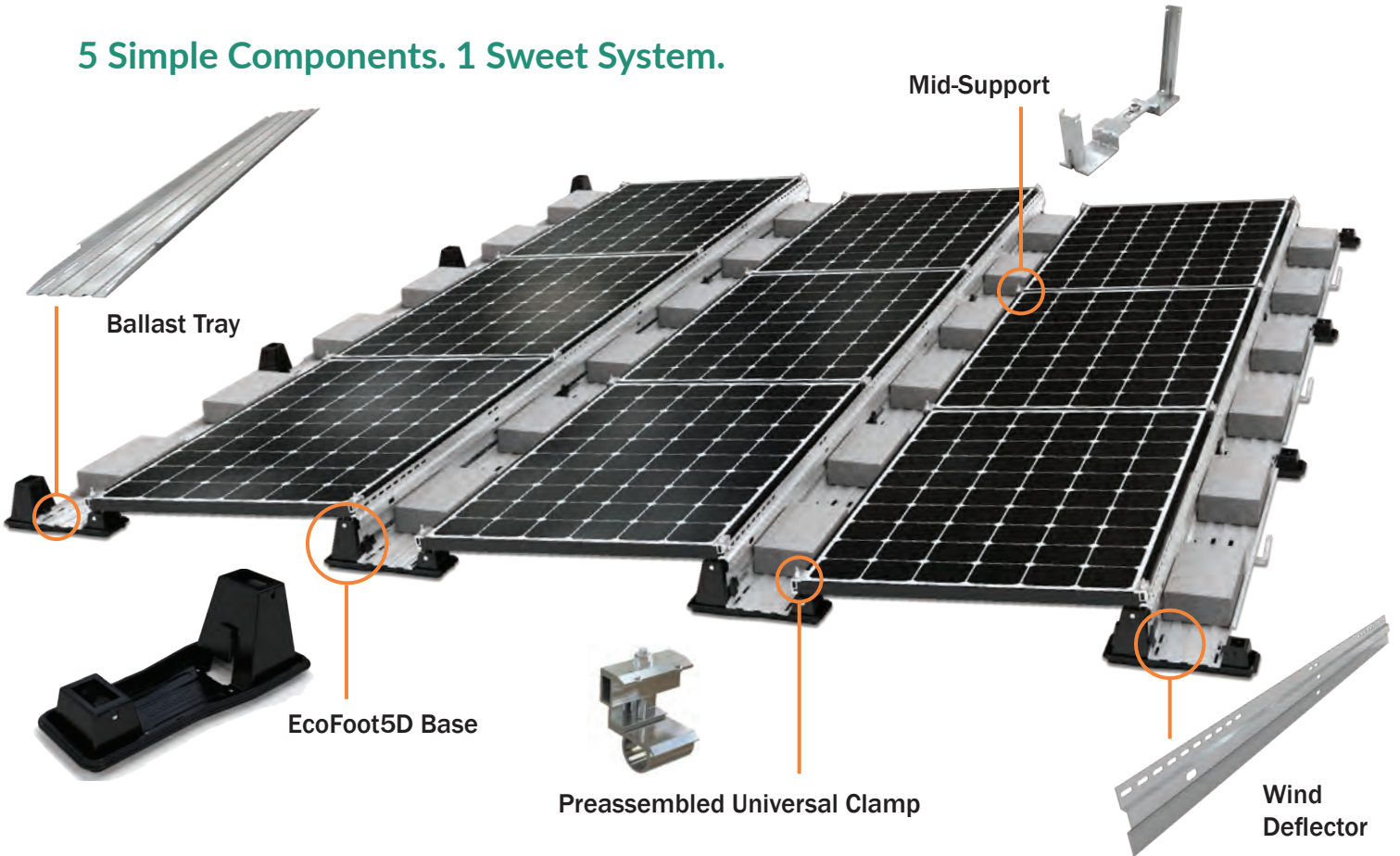
Streamline logistics with up to 290kW of Bases per pallet.



# Max Out Your Roof



## 5 Simple Components. 1 Sweet System.

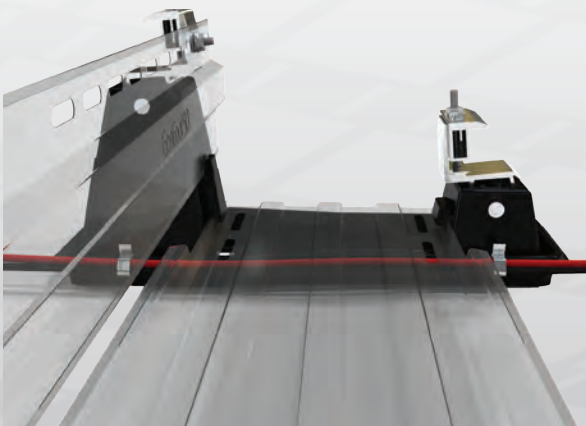


## Wire Management in a Snap.

### Accessible & Protected

Simply snap wire clips into Base to route wires between rows.

- No UV exposure: row-to-row wires covered by Ballast Tray
- Easy access to wires during install and throughout the life of the system with removable Wind Deflector and in-row ballast placement

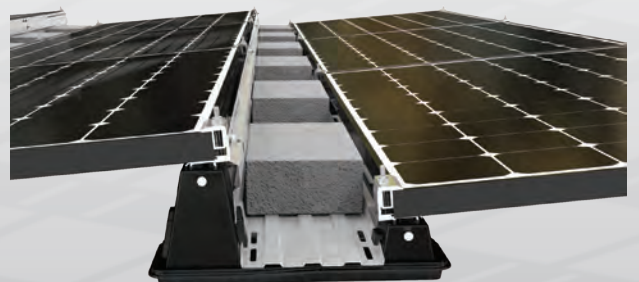


## Ballast Placement that Beats All.

### Ergonomic, Cost-Saving and Fast

Place ballasts between rows for easy reach.

- No awkward under-module access
- Rapid Ballast Tray install, sliding into Base retention clips
- Ballast Tray strong enough to walk on, even when loaded with ballast blocks
- Minimal roof contact means smaller slip sheets, lowering costs



# Unbeatable EcoFoot5D

## 6 Simple Installation Steps.

### Step 1 Install Clamps in Bases – No Tools Required.



Drop preassembled Clamps into Base, push in Clevis Pins, Base is ready to install.

### Step 2 Only Two Chalk Lines Needed.



Measure & mark 2 chalk lines, Bases self-align as modules drop into place.

### Step 3 Secure PV modules onto Bases.



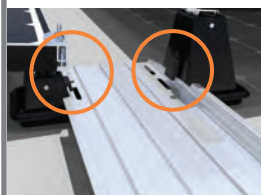
Space modules using alignment marks on Clamps, torque Nut provided to 14 ft-lbs.

### Step 4 Install Mid-Support.



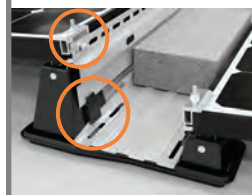
Press the Upper and Lower Mid-Supports onto the module frame.

### Step 5 Install Ballast Tray and place ballast blocks.



Slide Tray into retention clips on Base, east/west. Place ballast blocks without reaching using sturdy, walk-on tray.

### Step 6 Install Wind Deflector.



Place Wind Deflector into slot on Base, attach using Rocker Nut provided.

## Technical Specifications.

**Clamping range:** 32–50mm

**Typical system weight:** 2.4–7.7 psf

**Module orientation:** Landscape

**Tilt angle:** 5° Landscape

**Module inter-row spacing:** 9.9"

**Roof pitch:** 0° – 7°

**Ballast requirements:** 4" x 8" x 16"

**Wind tunnel tested:** 150 mph

**Warranty:** 25 years

**Slip sheets:** not required by Ecolibrium Solar. If required by roofer, use 7"x16.7" under Base; 2"x3" under Mid-Support.

## Validation Summary.

- Certified to UL2703 Fire Class A for Type I and II modules
- Certified to UL2703 Grounding and Bonding
- SEAOC seismic compliant

## Get the EcoFoot5D Advantage.

Ecolibrium Solar provides engineering support for your project from concept to completion. Contact us for a specific project bid, to schedule a product demo, or to learn more about simple, fast and cost-effective EcoFoot5D High Density 5° Racking.

Call 740.249.1877 or email [Sales@EcolibriumSolar.com](mailto:Sales@EcolibriumSolar.com)



**EcolibriumSolar**

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