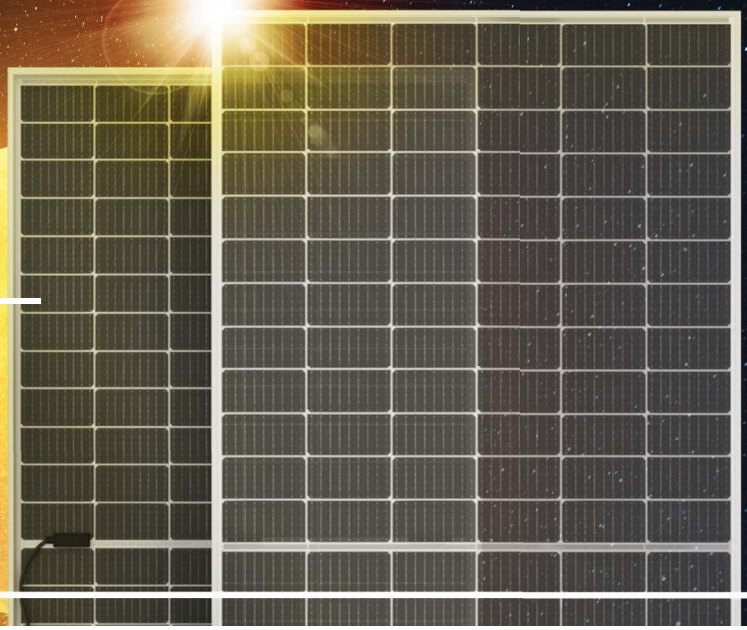
Philadelphia Solar
Delivering Clean Energy Solutions

PHENex

PS-M144(HCBF)-xxxW

Half-Cell 10BB Bifacial Module

540 -555 Watt (182mm Cell Size)



Philadelphia Solar's Mono-Crystalline modules with power up to **555 Wp** are produced using the state-of-the-art (automated) robotic production lines. These modules are suitable to be used for most electrical power applications and have excellent durability to prevailing weather conditions

CERTIFICATIONS

IEC 62782:2016 Dynamic load
IEC TS 62804 PID Resistance
IEC 60068 Dust and Sand Resistance
IEC 62716 Ammonia Resistance
IEC 61701 Salt Mist Resistance
UL 61215 / UL 61730
IEC 61215 / IEC 61730
EN ISO 9001: 2015
Quality Management System
EN ISO 14001: 2015
Environmental Management System
EN ISO 45001: 2018
Occupational health and safety management systems

TÜV AUSTRIA PTL PTL US CERTIFIED

APPLICATIONS

On-Grid Commercial/ Industrial Roof-Tops

Off-Grid Systems (Including Lighting Systems)

Solar Power Plants

TIER-1 Solar Panel Manufacturer

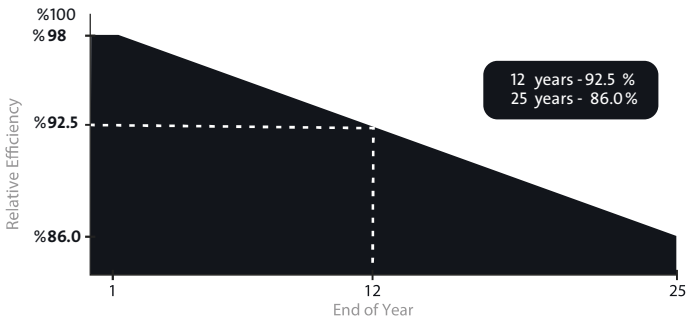
EUPD RESEARCH TOP BRAND PV MODULES 2022

Made In Jordan

FEATURES

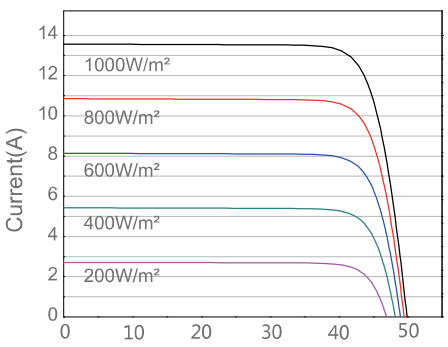
- Module's Cell Efficiency up to **23%**
- Lower microcrack problem loss comparing with 5-busbar module
- Lower internal resistance loss
- Lower degradation PERC technology
- Less partial shading current mismatch loss so more power output.
- Better temperature coefficients come from half-cell design.

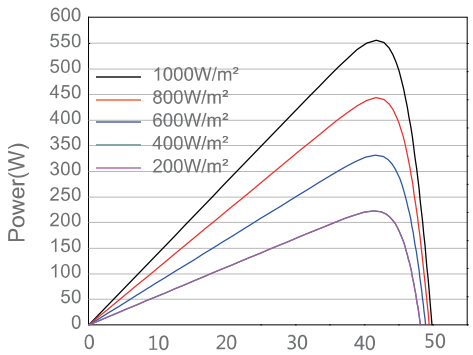
LINEAR PERFORMANCE WARRANTY



- **12** Year Product Warranty
- **25** Year Linear Power Warranty
- Only **-0.5%** Annual Degradation

I-V CURVES





ELECTRICAL CHARACTERISTICS

POWER AT STC	540 W	545W	550 W	555 W
Short Circuit Current - Isc (A)	13.59	13.64	13.69	13.73
Maximum Power Current - Impp (A)	12.96	13.00	13.05	13.09
Open Circuit Voltage - Voc (V)	49.78	50.00	50.25	50.50
Maximum Power Voltage - Vmpp (V)	41.69	41.94	42.19	42.42
Module Efficiency - η' (%)	20.9%	21.1%	21.3%	21.5%
Bifaciality Ratio (%)	65±5%			

Values at Standard Test Conditions STC (Air Mass AM 1.5 , Irradiance 1000 W/m^2 , Cell Temperature 25° C).

MATERIAL CHARACTERISTICS

Characteristics	Value
Cells per Module	144 (72 x 2)
Cell Type	Grade A - Mono PERC Crystalline Silicon/10 BB 182x91mm
Front Surface	3.2 Tempered AR Coated Glass
Encapsulant	PID Free EVA
Back Cover	Transparent Backsheet
Frame	Anodized Aluminum (Black/Silver)
Junction Box	IP68 , 3 Bypass Diodes
Cable Length	1200mm Cables Length with Original MC4 Connector
Fire Classification	Type I

THERMAL CHARACTERISTICS

Characteristics	Value
Open Voltage Temperature Coefficient VOC (%/C°)	-0.22
Short Circut Current Temperature Coefficient ISC (%/C°)	+0.05
Power Temperature Coefficient PMP (%/C°)	-0.35
NOCT (°C)	45±2

OPERATING CONDITIONS

Maximum Sytem Voltage - Vmax (V)	1500
Maximum Series Fuse (A)	25
Operating Temperature Range (°C)	IEC: -40 to +85 UL: -40 to +90

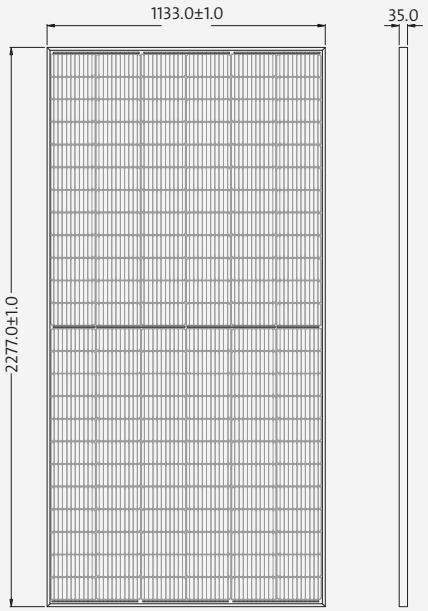
PHYSICAL CHARACTERISTICS

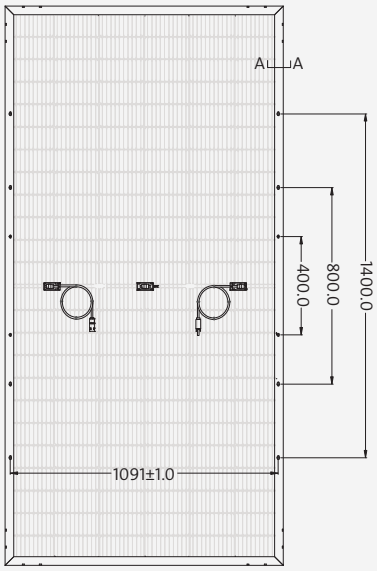
Characteristics	Value
Module Dimensions (mm)	2277±1 x 1133±1 x 35
Module Weight (kg)	29 ± 1kg

Packaging	Value
Modules per Pallet	31
40 Feet High-Cube Container	620 Modules

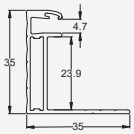
Mechanical Load**	Value
Max Static load (Front)	5400 Pa
Max Static load (Back)	2400 Pa
Dynamic load	1000 Pa

MODULE DRAWINGS





Cross Section A-A



- Power measuring tolerance: ± 3%, other measurements tolerances: ± 5%.
- Datasheet is subjected to change without prior notice, always obtain the most recent version of the datasheet.
- ** Caution: For professional use only, the installation and handling of PV modules and cleaning modules require professional skills and should only be performed by qualified professionals, please read the Installation and Operation Manual before using the modules, also Cleaning Guidelines

Updated Oct 2022

Power Optimizer

P605 / P650 / P701 / P730 / P800p / P801 / P850 / P950 / P1100

POWER OPTIMIZER

PV power optimization at the module level

The most cost-effective solution for commercial and large field installations

- Specifically designed to work with SolarEdge inverters
- Up to 25% more energy
- Superior efficiency (99.5%)
- Balance of System cost reduction; 50% less cables, fuses and combiner boxes, over 2x longer string lengths possible
- Fast installation with a single bolt
- Advanced maintenance with module-level monitoring
- Module-level voltage shutdown for installer and firefighter safety
- Use with up to two PV modules connected in series or in parallel

solaredge

/ Power Optimizer

P605 / P650 / P701 / P730 / P801

Power Optimizer Model (Typical Module Compatibility)	P605 (for 1 x high power PV modules)	P650 (for up to 2 x 60-cell PVmodules)	P701 (for up to 2 x 60/120-cell PV modules)	P730 (for up to 2x 72-cell PVmodules)	P801 (for up to 2 x 72/144-cell PV modules)	
INPUT						
Rated Input DC Power(1)	605	650	700*	730**	800	W
Connection Method	Single input for series connected modules					
Absolute Maximum Input Voltage (Voc at lowest temperature)	65	96		125		Vdc
MPPT Operating Range	12.5 - 65	12.5 - 80		12.5 - 105		Vdc
Maximum Short Circuit Current per Input (Isc)	14.1	11	11.75	11**	11.75	Adc
Maximum Efficiency	99.5					%
Weighted Efficiency	98.6					%
Overvoltage Category	II					
OUTPUT DURING OPERATION (POWER OPTIMIZER CONNECTED TO OPERATING SOLAREDGE INVERTER)						
Maximum Output Current	15					Adc
Maximum Output Voltage	80					Vdc
OUTPUT DURING STANDBY (POWER OPTIMIZER DISCONNECTED FROM SOLAREDGE INVERTER OR SOLAREDGE INVERTER OFF)						
Safety Output Voltage per Power Optimizer	1 ± 0.1					Vdc
STANDARD COMPLIANCE						
EMC	FCC Part 15 Class B, IEC61000-6-2, IEC61000-6-3					
Safety	IEC62109-1 (class II safety)					
RoHS	Yes					
Fire Safety	VDE-AR-E 2100-712:2013-05					
INSTALLATION SPECIFICATIONS						
Compatible SolarEdge Inverters	Three phase inverters SE16K & larger					
Maximum Allowed System Voltage	1000					Vdc
Dimensions (W x L x H)	129 x 153 x 52 / 5.1 x 6 x 2	129 x 153 x 42.5 / 5.1 x 6 x 1.7		129 x 153 x 49.5 / 5.1 x 6 x 1.9		mm / in
Weight	1064 / 2.3	834 / 1.8		933 / 2.1		gr / lb
Input Connector	MC4(2)					
Input Wire Length	0.16 / 0.52			0.16 / 0.52 , 0.9 / 2.95(3)		m / ft
Output Connector	MC4					
Output Wire Length	Portrait orientation: 1.4 / 4.5	Portrait orientation: 1.2 / 3.9	-	Portrait orientation:1.2 / 3.9		m / ft
	-	Landscape orientation: 1.8 / 5.9		Landscape orientation: 2.2 / 7.2		
Operating Temperature Range(4)	-40 to +85 / -40 to +185					°C / °F
Protection Rating	IP68 / NEMA6P					
Relative Humidity	0 - 100					%

* For P701 models manufactured after work week 06/2020, the rated DC input is 740W

** For P730 models manufactured after work week 06/2020, the rated DC input is 760W and the maximum Isc per input is 11.75A

(1) Rated power of the module at STC will not exceed the Power Optimizer "Rated Input DC Power". Modules with up to +5% power tolerance are allowed

(2) For other connector types please contact SolarEdge

(3) Longer inputs wire length are available for use with split junction box modules. (For 0.9m/2.95ft order P730-xxxLxxx)

(4) For ambient temperature above +70°C / +158°F power de-rating is applied. Refer to Power Optimizers Temperature De-Rating Technical Note for more details

PV System Design Using a SolarEdge Inverter(5)(6)(7)		230/400V Grid SE16K, SE17K, SE25K*, SE33.3K*		230/400V Grid SE27.6K*		230/400V Grid SE30K*		277/480V Grid SE33.3K*, SE40K*		
Compatible Power Optimizers		P605	P650, P701, P730, P801	P605	P650, P701, P730, P801	P605	P650, P701, P730, P801	P605	P650, P701, P730, P801	
Minimum String Length	Power Optimizers	14	14	14	14	15	15	14	14	
	PV Modules	14	27	14	27	15	29	14	27	
Maximum String Length	Power Optimizers	30	30	30	30	30	30	30	30	
	PV Modules	30	60	30	60	30	60	30	60	
Maximum Continuous Power per String		11250		11625		12750		12750		W
Maximum Allowed Connected Power per String(8) (Permitted only when the difference in connected power between strings is 2,000W or less)		13500		13500		15000		15000		W
Parallel Strings of Different Lengths or Orientations		Yes								

* The same rules apply for Synergy units of equivalent power ratings, that are part of the modular Synergy Technology inverter

(5) P650/P701/P730/P801 can be mixed in one string only with P650/P701/P730/P801. P605 cannot be mixed with any other power optimizer in the same string

(6) For each string, a Power Optimizer may be connected to a single PV module if 1) each Power Optimizer is connected to a single PV module or 2) it is the only Power Optimizer connected to a single PV module in the string

(7) For SE16K and above, the minimum STC DC connected power should be 11KW

(8) To connect more STC power per string, design your project using SolarEdge Designer

/ Power Optimizer

P800p / P850 / P950 / P1100

Power Optimizer Model (Typical Module Compatibility)	P800p (for up to 2 x 96-cell 5" PV modules)	P850 (for up to 2 x highpower or bi-facial modules)	P950 (for up to 2 x highpower or bi-facial modules)	P1100 (for up to 2 x highpower or bi-facial modules)	
INPUT					
Rated Input DC Power[1]	800	850	950	1100	W
Connection Method	Dual input for independently connected[7]	Single input for series connected modules			
Absolute Maximum Input Voltage (Voc at lowest temperature)	83	125			Vdc
MPPT Operating Range	12.5 - 83	12.5 - 105			Vdc
Maximum Short Circuit Current per Input (Isc)	7	14.1*		14.1	Adc
Maximum Efficiency	99.5				%
Weighted Efficiency	98.6				%
Overvoltage Category	II				
OUTPUT DURING OPERATION (POWER OPTIMIZER CONNECTED TO OPERATING SOLAREDGE INVERTER)					
Maximum Output Current	18	18			Adc
Maximum Output Voltage	80				Vdc
OUTPUT DURING STANDBY (POWER OPTIMIZER DISCONNECTED FROM SOLAREDGE INVERTER OR SOLAREDGE INVERTER OFF)					
Safety Output Voltage per Power Optimizer	1 ± 0.1				Vdc
STANDARD COMPLIANCE					
EMC	FCC Part 15 Class B, IEC61000-6-2, IEC61000-6-3				
Safety	IEC62109-1 (class II safety)				
RoHS	Yes				
Fire Safety	VDE-AR-E 2100-712:2013-05				
INSTALLATION SPECIFICATIONS					
Compatible SolarEdge Inverters	Three phase inverters SE16K & larger			Three phase inverters SE25K & larger	
Maximum Allowed System Voltage	1000				Vdc
Dimensions (W x L x H)	129 x 168 x 59 / 5.1 x 6.61 x 2.32	129 x 162 x 59 / 5.1 x 6.4 x 2.32			mm / in
Weight	1064 / 2.3	1064 / 2.3			gr / lb
Input Connector	MC4[2]				
Input Wire Length	0.16 / 0.52	0.16 / 0.52, 0.9 / 2.95, 1.3 / 4.26, 1.6 / 5.24[3]	0.16 / 0.52, 1.3 / 4.26, 1.6 / 5.24[3]	0.16 / 0.52, 1.3 / 4.26[3]	m / ft
Output Connector	MC4				
Output Wire Length	Portrait orientation: 1.2 / 3.9			2.4 / 7.8	m / ft
	Landscape orientation: 1.8 / 5.9	Landscape orientation: 2.2 / 7.2			
Operating Temperature Range[4]	-40 to +85 / -40 to +185				°C / °F
Protection Rating	IP68 / NEMA6P				
Relative Humidity	0 - 100				%

* For P850/P950 models manufactured in work week 06/2020 or earlier, the maximum Isc per input is 12.5A. The manufacture code is indicated in the Power Optimizer's serial number example: S/N SJ0620A-xxxxxxxx (work week 06 in 2020)

(1) Rated power of the module at STC will not exceed the Power Optimizer "Rated Input DC Power". Modules with up to +5% power tolerance are allowed

(2) For other connector types please contact SolarEdge

(3) Longer inputs wire length are available for use with split junction box modules
(For 0.9m/2.95ft order P801/P850-xxxLxxx. For 1.3m/2.95ft order P850/P950/P1100 -xxxXxxx. For 1.6m/5.24ft order P850/P950 xxxYxxx)

(4) For ambient temperature above +70°C / +158°F power de-rating is applied. Refer to Power Optimizers Temperature De-Rating Technical Note for more details

PV System Design Using a SolarEdge Inverter[5][6][7]		230/400V Grid SE16K, SE17K	230/400V Grid SE25K*	230/400V Grid SE27.6K*	230/400V Grid SE30K*	230/400V Grid SE33.3K*	277/480V Grid SE33.3K*, SE40K*	
Compatible Power Optimizers		P800p, P850, P950	P800p, P850, P950, P1100	P800p, P850, P950, P1100	P800p, P850, P950, P1100	P800p, P850, P950, P1100	P800p, P850, P950, P1100	
Minimum String Length	Power Optimizers	14	14	14	15	14	14	
	PV Modules	27	27	27	29	27	27	
Maximum String Length	Power Optimizers	30	30	30	30	30	30	
	PV Modules	60	60	60	60	60	60	
Maximum Continuous Power per String		13500	13500	13950	15300	13500	15300	W
Maximum Allowed Connected Power per String[8] (Permitted only when the difference in connected power between strings is 2,000W or less)		1 string - 15750	1 string - 15750	1 string - 16200	1 string - 17550	2 strings or less - 15750	2 strings or less - 17550	W
		2 strings or more - 18500	2 strings or more - 18500	2 strings or more - 18950	2 strings or more - 20300	3 strings or more - 18500	3 strings or more - 20300	
Parallel Strings of Different Lengths or Orientations		Yes						

* The same rules apply for Synergy units of equivalent power ratings, that are part of the modular Synergy Technology inverter

(5) P800p/P850/P950/P1100 can be mixed in one string only with P800p/P850/P950/P1100

(6) For each string, a Power Optimizer may be connected to a single PV module if 1) each Power Optimizer is connected to a single PV module or 2) it is the only Power Optimizer connected to a single PV module in the string

(7) For SE16K and above, the minimum STC DC connected power should be 11KW

(8) To connect more STC power per string, design your project using SolarEdge Designer

SolarEdge is a global leader in smart energy technology. By leveraging world-class engineering capabilities and with a relentless focus on innovation, SolarEdge creates smart energy solutions that power our lives and drive future progress.

SolarEdge developed an intelligent inverter solution that changed the way power is harvested and managed in photovoltaic (PV) systems. The SolarEdge DC optimized inverter maximizes power generation while lowering the cost of energy produced by the PV system.

Continuing to advance smart energy, SolarEdge addresses a broad range of energy market segments through its PV, storage, EV charging, UPS, and grid services solutions.

SolarEdge
@SolarEdgePV
@SolarEdgePV
SolarEdgePV
SolarEdge
www.solaredge.com/corporate/contact

solaredge.com

© SolarEdge Technologies, Ltd. All rights reserved. SOLAREDGE, the SolarEdge logo, OPTIMIZED BY SOLAREDGE are trademarks or registered trademarks of SolarEdge Technologies, Inc. All other trademarks mentioned herein are trademarks of their respective owners. Date: 07/2021 DS-000012-2.5-ENG Subject to change without notice.

Cautionary Note Regarding Market Data and Industry Forecasts: This brochure may contain market data and industry forecasts from certain third-party sources. This information is based on industry surveys and the preparer's expertise in the industry and there can be no assurance that any such market data is accurate or that any such industry forecasts will be achieved. Although we have not independently verified the accuracy of such market data and industry forecasts, we believe that the market data is reliable and that the industry forecasts are reasonable.

CE

INVERTERS

Three Phase Inverters for the 120/208V Grid

For North America

SE10KUS / SE17.3KUS

12-20 YEAR WARRANTY

The best choice for SolarEdge enabled systems

- Specifically designed to work with power optimizers
- Quick and easy inverter commissioning directly from a smartphone using SolarEdge SetApp
- Fixed voltage inverter for superior efficiency and longer strings
- Built-in type 2 DC and AC Surge Protection, to better withstand lightning events
- Small, lightest in its class, and easy to install outdoors or indoors on provided bracket
- Integrated arc fault protection and rapid shutdown for NEC 2014, 2017, and 2020, per article 690.11 and 690.12
- Built-in module-level monitoring with Ethernet, wireless or cellular communication for full system visibility
- Integrated Safety Switch
- UL1741 SA and SB certified, for CPUC Rule 21 grid compliance

/ Three Phase Inverters for the 120/208V Grid(1)

For North America

SE10KUS / SE17.3KUS

Model Number	SE10KUS	SE17.3KUS	
Applicable to inverters with part number	SEXXK-USX2IXXXX		
OUTPUT			
Rated AC Power Output	10000	17300	W
Maximum Apparent AC Output Power	10000	17300	VA
AC Output Line Connections	3W + PE, 4W + PE		
AC Output Voltage Minimum-Nominal-Maximum(2) (L-N)	105 – 120 – 132.5		Vac
AC Output Voltage Minimum-Nominal-Maximum(2) (L-L)	183 – 208 – 229		Vac
AC Frequency Minimum-Nominal-Maximum(2)	59.3 – 60 – 60.5		Hz
Continuous Output Current (per Phase)	27.8	48.25	Aac
GFDI Threshold	1		A
Utility Monitoring, Islanding Protection, Country Configurable Set Points	Yes		
THD	≤ 3		%
Power Factor Range	+/- 0.85 to 1		
INPUT			
Maximum DC Power (Module STC)	17500	30275	W
Transformer-less, Ungrounded	Yes		
Maximum Input Voltage DC+ to DC-	600		Vdc
Operating Voltage Range	370 – 600		Vdc
Maximum Input Current	27.8	48.25	Adc
Maximum Input Short Circuit Current	55		Adc
Reverse-Polarity Protection	Yes		
Ground-Fault Isolation Detection	167kΩ Sensitivity(3)		
CEC Weighted Efficiency	97	97.5	%
Night-time Power Consumption	< 4		W
ADDITIONAL FEATURES			
Supported Communication Interfaces	2 x RS485, Ethernet, Cellular (optional)		
Inverter Commissioning	With the SetApp mobile application using built-in Wi-Fi access point for local connection		
Rapid Shutdown	NEC2014, NEC2017 and NEC2020 compliant/certified		
RS485 Surge Protection Plug-in	Supplied with the inverter, Built-in		
AC, DC Surge Protection	Type II, field replaceable, Built-in		
DC Fuses (Single Pole)	25A, Built-in		
Smart Energy Management	Export Limitation		
DC SAFETY SWITCH			
DC Disconnect	Integrated		
STANDARD COMPLIANCE			
Safety	UL1741, UL1741 SA, UL1741 SB, UL1699B, CSA C22.2, Canadian AFCI according to T.I.L. M-07		
Grid Connection Standards	IEEE1547-2018, Rule 21, Rule 14 (HI)		
Emissions	FCC part15 class A		
INSTALLATION SPECIFICATIONS			
AC Output Conduit size /AWG range	¾" or 1" / 6 - 10 AWG		
DC Input Conduit size / AWG range	¾" or 1" / 6 - 12 AWG		
Number of DC inputs pairs	4		
Dimensions with Safety Switch (H x W x D)	31.8 x 12.5 x 11.8 / 808 x 317 x 300		in / mm
Weight with Safety Switch	78.2 / 35.5		lb / kg
Cooling	Fans (user replaceable)		
Noise	< 62		dBA
Operating Temperature Range	-40 to +140 / -40 to +60(4)		˚F / ˚C
Protection Rating	NEMA 3R		
Mounting	Bracket provided		

(1) For 277/480V inverters refer to the Three Phase Inverters for the 277/480V Grid for North America datasheet.
(2) For other regional settings please contact SolarEdge support.
(3) Where permitted by local regulations.
(4) For power de-rating information refer to the Temperature De-rating - Technical Note (North America).

© SolarEdge Technologies, Ltd. All rights reserved. SOLAREDGE, the SolarEdge logo, OPTIMIZED BY SOLAREDGE are trademarks or registered trademarks of SolarEdge Technologies, Inc.
All other trademarks mentioned herein are trademarks of their respective owners. Date: November 27, 2022 DS-000069-NAM. Subject to change without notice.

CE

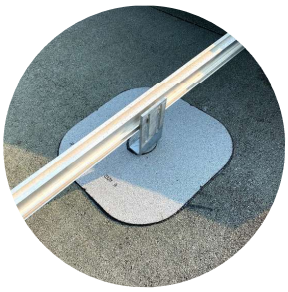
TerraGen Solar

TGR Flat Roof Mounting Solution

Whether you are ballasting the system or mechanically fastening it to the roof, TGR is the best solution for you. Safe, economic, lightweight, flexible, and easy to install are just of few of the benefits.

Uplift Resistance Options

Ballast



Mechanical Attachment

Custom

Codes & Standards

ASCE AMERICAN SOCIETY OF CIVIL ENGINEERS

ICC INTERNATIONAL CODE COUNCIL

c UL us LISTED

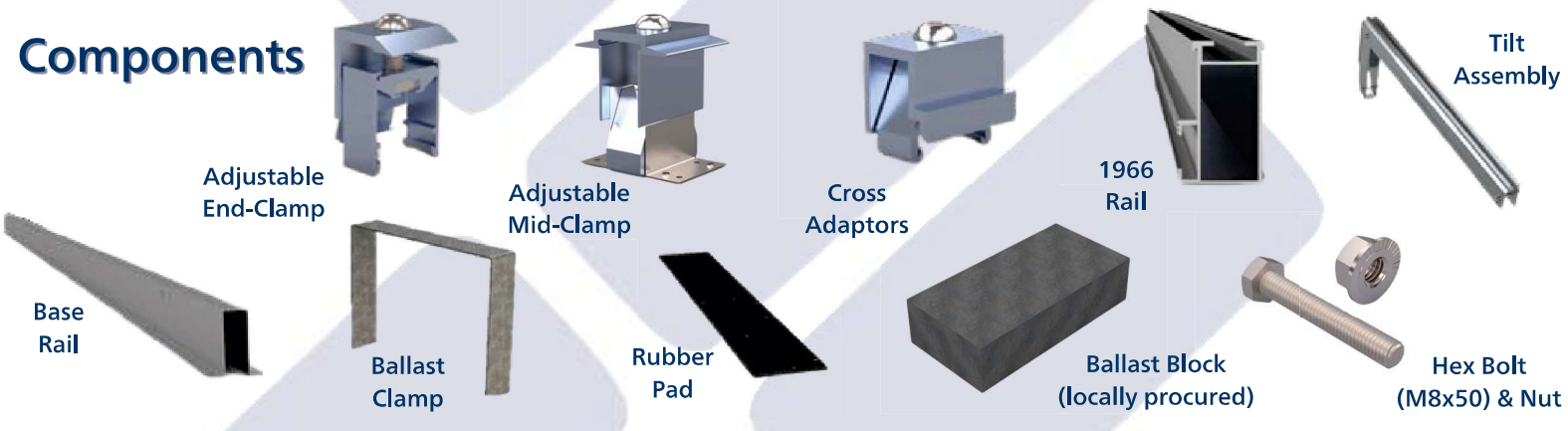
RWDI CONSULTING ENGINEERS & SCIENTISTS

Tel: 705-435-7373 | www.terragensolar.ca | info@terragensolar.ca | 120 Parsons Rd, Alliston, ON L9R 1E9

Features and Benefits

- **Rail Based**
  - Low ballast requirements, as low as 2.3psf
  - Clean and accessible wire management
  - Doesn't rely on the module for load sharing increasing microcracks
- **Clamp in Module Green Zones**
  - Maintain module warranty
  - Allows for highest load rating for snow load or high wind regions
- **Flexible Design**
  - Any tilt angle or row spacing to the customer's specifications to maximize power generation.
  - Higher tilt options unique to the market
  - Any row spacing to maximize panel density
- **No Wind Screen Required**
  - Installation efficiencies
  - Cooling effects on modules lead to increased performance
  - Reduce snow build up on following module
- **Service From Start to Finish**
  - Project management and support
  - Project specific engineering packages
  - Construction package walkthroughs
  - Experienced and knowledgeable support team

Components



Technical Specs

Tilt Angle:	0° - 35°	**Building Height:**	Any
Panel Orientation:	Portrait or landscape	**Wind Speed:**	Any
Row Spacing:	Customizable	**Wind Tunnel Testing:**	RWDI
Roof Type:	All roof types	**Certifications:**	UL 2703, LTR AE-001-2012
Roof Attachment	Ballast, Anchor or Hybrid	**Warranty:**	Standard 10 with 15-20 available upon request
Material:	Aluminum, stainless steel & galvanized steel		

Tel: 705-435-7373 | www.terragensolar.ca | info@terragensolar.ca | 120 Parsons Rd, Alliston, ON L9R 1E9