

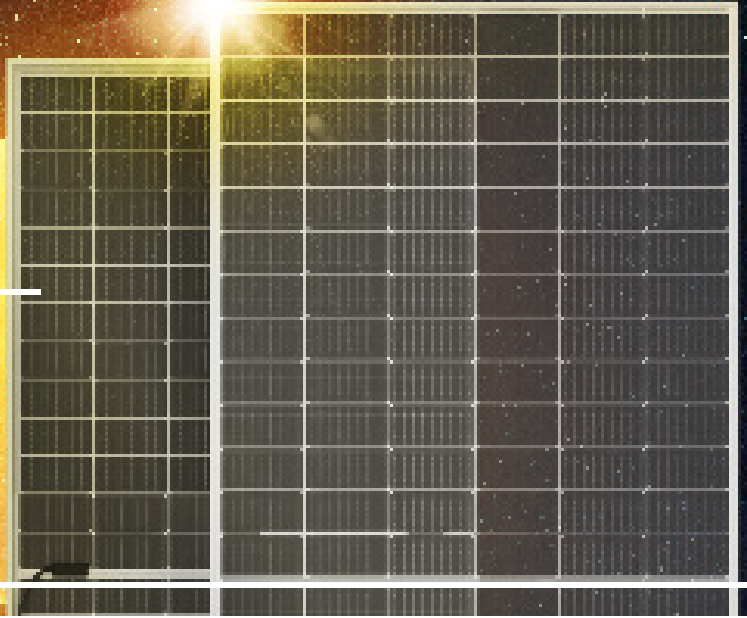


**Philadelphia Solar**  
Delivering Clean Energy Solutions

# PHEVex

**PS-M156(HCBF)-GG-xxxW**  
Half-Cell 10BB Bifacial Double Glass Module

**580 -590 Watt** (182mm Cell Size)



Philadelphia Solar's Mono-Crystalline modules with power up to **590 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 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



## APPLICATIONS



On-Grid Commercial/  
Industrial Roof-Tops



Off-Grid Systems  
(Including Lighting Systems)



Solar Power Plants

## FEATURES



Module Efficiency up to **21.29%**



Lower internal resistance loss



Less partial shading current mismatch loss so more power output.



Lower microcrack problem loss comparing with 5-busbar module



Lower degradation PERC technology

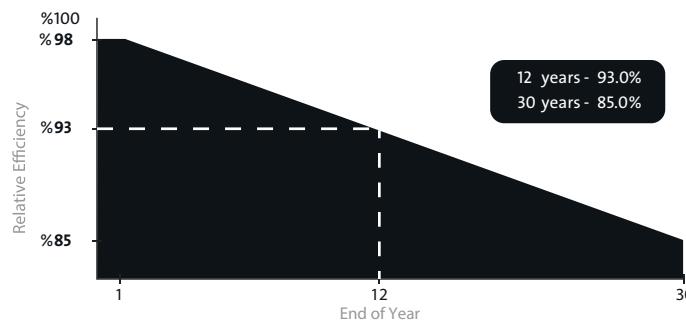


Better temperature coefficients come from half-cell design.



Made In Jordan

## LINEAR PERFORMANCE WARRANTY



12 Year Product Warranty

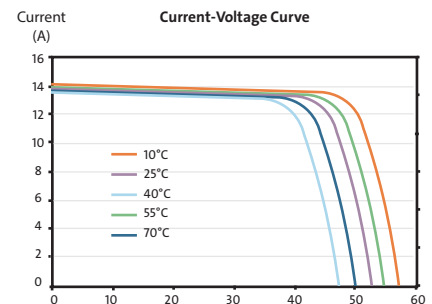
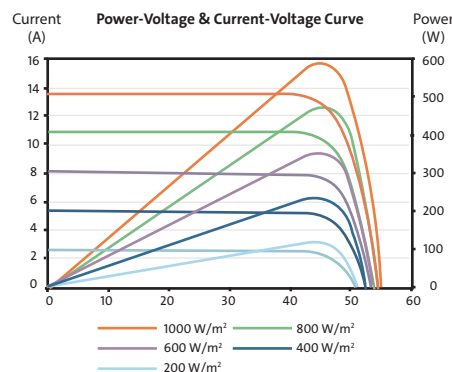


30 Year Linear Power Warranty



Only **-0.45%** Annual Degradation

## I-V CURVES



## ELECTRICAL CHARACTERISTICS

POWER AT STC	580 W	585 W	590 W
Short Circuit Current - I <sub>sc</sub> (A)	13.65	13.71	13.76
Maximum Power Current - I <sub>mpp</sub> (A)	12.79	12.84	12.90
Open Circuit Voltage - V <sub>oc</sub> (V)	54.12	54.35	54.60
Maximum Power Voltage - V <sub>mpp</sub> (V)	45.35	45.57	45.74
Module Efficiency - η' (%)	20.70%	20.88%	21.06%

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

POWER AT NMOT	432.85 W	436.59 W	440.37 W
Short Circuit Current - I <sub>sc</sub> (A)	11.02	11.07	11.11
Maximum Power Current - I <sub>mpp</sub> (A)	10.24	10.28	10.33
Open Circuit Voltage - V <sub>oc</sub> (V)	50.61	50.83	51.06
Maximum Power Voltage - V <sub>mpp</sub> (V)	42.27	42.47	42.63

Values at Nominal Module Operation Temperature NMOT (wind speed 1m/s, Irradiance 800 W/m<sup>2</sup>, Cell Temperature 20° C).

BIFACIAL GENERATION DATA (FOR 590W)			
Power gain	5%	15%	25%
Maximum Power (W)	619.77	678.78	737.78
Module Efficiency - η' (%)	22.12%	24.22%	26.33%
Short Circuit Current - I <sub>sc</sub> (A)	14.45	15.82	17.20
Maximum Power Current - I <sub>mpp</sub> (A)	13.55	14.84	16.13
Open Circuit Voltage - V <sub>oc</sub> (V)	54.60	54.60	54.60
Maximum Power Voltage - V <sub>mpp</sub> (V)	45.74	45.74	45.74

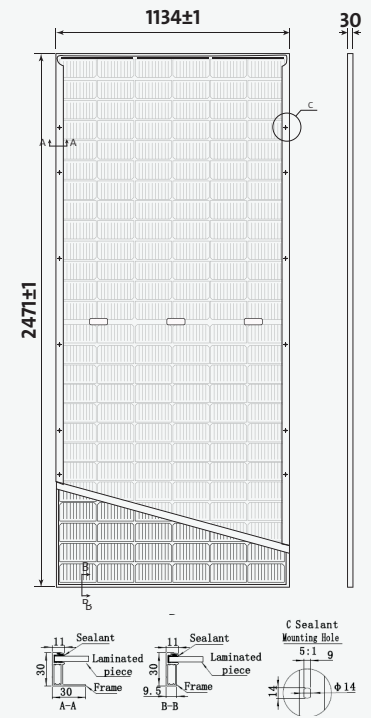
## MATERIAL CHARACTERISTICS

Characteristics	Value
Cells per Module	156 ((6 x1 3)x2)
Cell Type	Grade A - Mono PERC Crystalline Silicon/Bifacial/10BB 182x91mm
Front Surface	Semi -Tempered Pattern Coated Glass
Encapsulant	EVA/POE+POE
Back Cover	Semi -Tempered Pattern /Porcelain Glass
Frame	AL 6063-T5/6005-T6
Junction Box	Protection Degree IP68
Cable Length	300mm (4mm <sup>2</sup> ) Cables Length (Can be Customized)
Fire Classification	Type I

## OPERATING CONDITIONS

Maximum Sytem Voltage - V <sub>max</sub> (V)	Operating Temperature Range (°C)	Maximum Series Fuse (A)
1500	-40 to +85	25

## MODULE DRAWINGS



## PHYSICAL CHARACTERISTICS

Characteristics	Value
Module Dimensions (mm)	2471 x 1134 x 30
Module Weight (kg)	35.3 ± 1
Packaging	Value
Modules per Pallet	35
40 Feet High-Cube Container	560 Modules
Mechanical Load	Value
Max Static load (Front)	5400 Pa
Max Static load (Back)	2400 Pa
Dynamic load	1000 Pa

## THERMAL CHARACTERISTICS

Characteristics	Value
Open Voltage Temperature Coefficient VOC (%/C°)	-0.267
Short Circuit Current Temperature Coefficient ISC (%/C°)	+0.049
Power Temperature Coefficient PMP (%/C°)	-0.349
NOCT (°C)	45±2

- ◆ 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