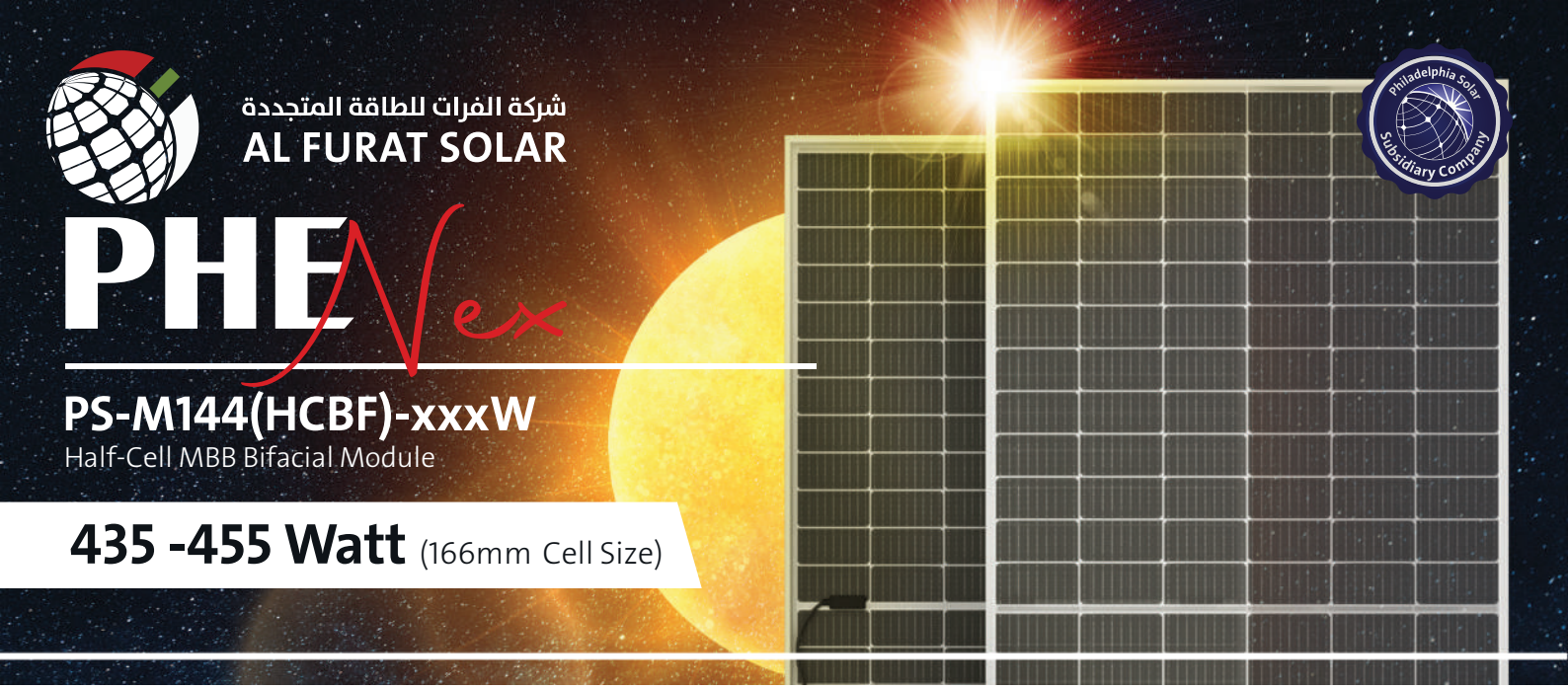
شركة الفرات للطاقة المتجددة
AL FURAT SOLAR

# PHENex

## PS-M144(HCBF)-xxxW

Half-Cell MBB Bifacial Module

## 435 -455 Watt (166mm Cell Size)



Philadelphia Solar Subsidiary Company

Philadelphia Solar's Mono-Crystalline modules with power up to **455 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

UL 61730
IEC 61215 / IEC 61730
IEC TS 62804 – PID Resistance
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 Residential Roof-Tops

On-Grid Commercial/ Industrial Roof-Tops

Off-Grid Systems (Including Lighting Systems)

Solar Power Plants

TIER-1 Solar Panel Manufacturer

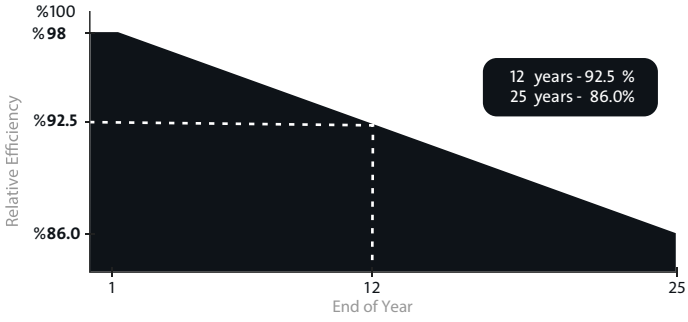
EUPD RESEARCH TOP BRAND PV MODULES 2022

Made In Jordan

### FEATURES

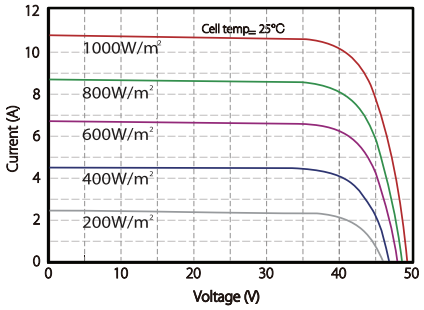
- Module's Cell Efficiency up to **23%**
- Lower microcrack problem loss comparing with 5-busbar module
- Lower internal resistance loss
- Lower degradation PERC technology
- Less partial shading current mismatch loss so more power output.
- Better temperature coefficients come from half-cell design.

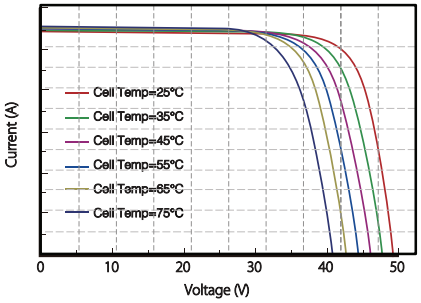
### LINEAR PERFORMANCE WARRANTY




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

### I-V CURVES



## ELECTRICAL CHARACTERISTICS

| POWER AT STC | 435 W | 440 W | 445 W | 450 W | 455 W |
|---|---|---|---|---|---|
| Short Circuit Current - Isc (A) | 11.19 | 11.24 | 11.29 | 11.33 | 11.38 |
| Maximum Power Current - Impp (A) | 10.55 | 10.60 | 10.65 | 10.69 | 10.74 |
| Open Circuit Voltage - Voc (V) | 49.09 | 49.39 | 49.69 | 49.98 | 50.28 |
| Maximum Power Voltage - Vmpp (V) | 41.24 | 41.54 | 41.84 | 42.12 | 42.42 |
| Module Efficiency - η' (%) | 20.0% | 20.2% | 20.5% | 20.7% | 21.0% |

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 |
| Front Surface | Anti-Reflective Coated Tempered 3.2 mm Glass |
| Encapsulant | PID Free EVA |
| Back Cover | Transparent Backsheet |
| Frame | Anodized Aluminum |
| Junction Box | IP68 , 3 Bypass Diodes |
| Cable Length | 300mm Cables Length (Can be Customized) |
| 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) | 20 |
| Operating Temperature Range (°C) | IEC: -40 to +85<br>UL: -40 to +90 |

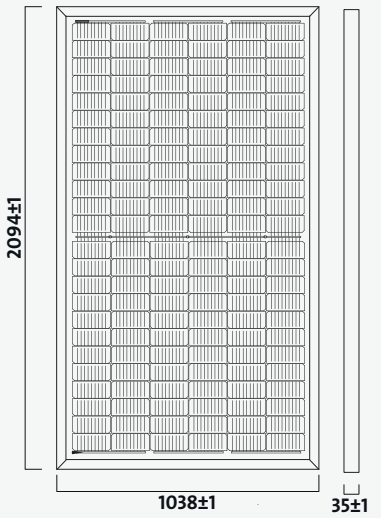
## PHYSICAL CHARACTERISTICS

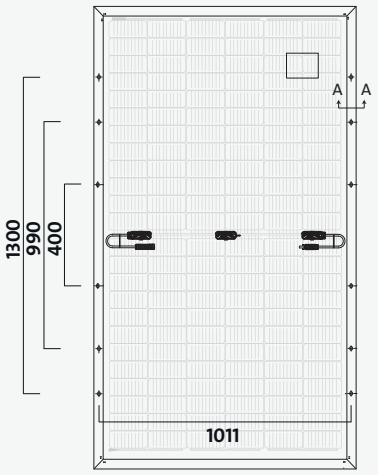
| Characteristics | Value |
|---|---|
| Module Dimensions (mm) | 2094±1 x 1038±1 x 35±1 |
| Module Weight (kg) | 24 ± 3% |

| Packaging | Value |
|---|---|
| Modules per Pallet | 31/34 |
| 40 Feet High-Cube Container | 715 Modules |

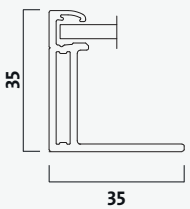
| Mechanical Load | Value |
|---|---|
| Max Static load (Front) | 5400 Pa |
| Max Static load (Back) | 2400 Pa |
| Dynamic Load | 1000 Pa |

## 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