

# Phono Solar

## POLY CRYSTALLINE MODULE SERIES PS210-240P

### High Performance Solar Panels

Phono Solar's 210-240 Poly Series is a robust 60 cell PV panel designed for on-grid residential and commercial applications.

Quality control measures and strict factory testing ensure that Phono Solar panels exceed customers expectations.

### Phono Solar Advantages

#### History

Phono Solar has been producing PV Modules since 2004. As part of the Sumec Group and the Sinomach family of businesses, Phono Solar is backed by parent companies with 15 Billion USD in annual sales revenue.

#### Financial Strength

As part of the Sumec and Sinomach family of companies, Sumec has the financial support of two of the oldest, most profitable companies in Asia. This is critical when considering that a PV module is meant to last at least 25-years. Customers can be assured Phono Solar will be around to honor its warranty commitment.

#### Quality products at an excellent price

Phono Solar modules carry a STC/PTCof 91% and module efficiency of 14.8%. This puts Phono Solar at the top of the CEC approved suppliers list. Higher efficiency modules lead to higher potential rebates. Phono Solar helps the customer maximize their system productivity.

#### Performance

Excellent PTC ratings, efficient manufacturing facilities and industry-leading quality controls makes Phono Solar's modules the right choice for any installation. Additionally, Phono Solar PV modules carry a 25-year performance guarantee.

#### Capacity

In relatively short time, Phono Solar has become one of the top exporters in the Solar Industry. Phono Solar's three production facilities will produce more than 500MW of PV Modules in 2011.

#### North American Focus

With a North American sales office and Southern California based distribution center, we offer logistical expertise for all regions within the US customers are supported by a team of dedicated industry professionals that value strategic business relationships and strive to maintain long-term partnerships.

#### Warranty Conditions:

- ▶ 5 years product warranty
- ▶ 25-year performance guarantee (90% up to 10 years, 80% up to 25 years)
- ▶ Product certification to UL 1703
- ▶ CEC (California Energy Commission) Program Registered
- ▶ Product certification to IEC 61215 (ed. 2)
- ▶ Protection class II / IEC 61730
- ▶ CE conformity
- ▶ Class C Fire rating
- ▶ FESC (Florida Solar Energy Center) PV Module Certification



### A Leader in Solar Manufacturing

At Phono Solar, our mission is to provide our customers with the highest quality PV modules at the most competitive price. Our focus on quality has led to our PV modules being used in installations worldwide. Our most recent installation is a 35MW Solar Power plant in Veprek, Czech Republic, which is the 9th largest solar power plant on earth.



Typical application	Length [x]	Width [y]	Height	Weight	Junction Box	Plug Connector	Cable	Front Glass Surface
20V DC	1640 (L) 64.6"	992 (W) 39.1"	45 (H) mm 1.8"	22Kg 48.4lbs	China	Amphenol MC4	35.4" (0.006 inch <sup>2</sup> )	3.2mm tempered glass

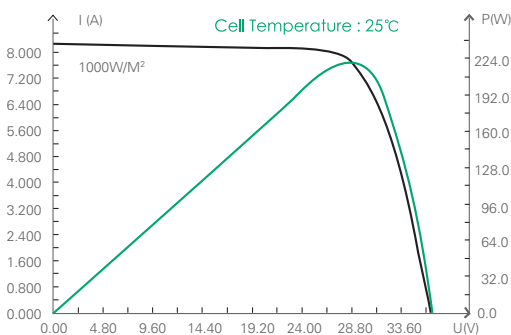
Crystalline Solar Module								
Performance Classes	210wp	215wp	220wp	225wp	230wp	235wp	240wp	
PTC Performance	190.1	194.7	199.4	204.0	288.6	213.3	217.9	
Structure	<ul style="list-style-type: none"> <li>▶ Glass-foil laminate</li> <li>▶ Anodized aluminum frame</li> <li>▶ Junction box (IP) 65 with 6 bypass diodes</li> <li>▶ Weather-resistant back sheet (white)</li> <li>▶ Cable 12 AWG (4mm)</li> </ul>							
Cells	6 x 10 pieces in series Poly crystal Si 156mm x 156mm square							

### Electrical Characteristics For STC

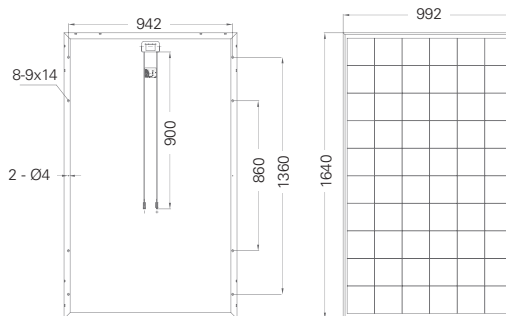
Designation	Pmpp [Wp]	Vmpp [V]	Impp [A]	Voc [V]	Isc [A]	Tolerance
PS210P-20/U	210W	28.6V	7.35A	36.5V	7.90A	± 3 %
PS215P-20/U	215W	28.8V	7.47A	36.7V	8.00A	± 3 %
PS220P-20/U	220W	29.0V	7.59A	36.9V	8.10A	± 3 %
PS225P-20/U	225W	29.2V	7.71A	37.0V	8.20A	± 3 %
PS230P-20/U	230W	29.4V	7.83A	37.1V	8.30A	± 3 %
PS235P-20/U	235W	29.6V	7.94A	37.3V	8.40A	± 3 %
PS240P-20/U	240W	29.8V	8.06A	37.5V	8.50A	± 3 %

Note: defined as standard deviation of thousands measurements. Absolute power values depend on the measuring system. They can differ by +/- 5% from one measuring system to another.

### Characteristic Curves



### Dimensions



### Assembly Notes

- ▶ See installation and operating manual at [www.phonosolarusa.com/products/modules](http://www.phonosolarusa.com/products/modules)
- ▶ Horizontal and vertical assembly possible
- ▶ System voltage max 600 V

Parameter	Values	Unit
Operating temperature	-40 +85	°C
Hail diameter @ 80Km/h	Up to 25	mm
Continuous wind pressure	Up to 130	Km/h
Load Capacity of Module	Up to 30	lb/ft <sup>2</sup>

### Weak Light Performance

Intensity [W/m <sup>2</sup> ]	Vmpp [%]	Impp [%]
900	0.0	-20
600	-0.9	-40
400	-2.1	-60
200	-5.1	-90
100	-8.7	-90

The electrical data applies for 25 °C and AM 1.5.

### Thermal Characteristics

Intensity [W/m <sup>2</sup> ]	Vmpp [%]
Operating temperature range	-45 to 85 °C
Temperature coefficient Pmpp	-0.51%/K
Temperature coefficient Voc	-0.37%/K
Temperature coefficient Isc	0.03%/K

### Partner Information

