

## ABOUT PHONO SOLAR

Phono Solar Technology Co., Ltd. is one of the world's leading renewable energy product manufacturers and a well-trusted provider. The Phono Solar brand has become synonymous with high performing, top quality photovoltaic panels that are ideal for use in large scale power plants, commercial and residential installations.

# DIAMOND Series 190-210

HIGH PERFORMANCE SOLAR  
MODULES

**Phono<sup>®</sup> Solar**  
SHARE THE SUN, POWER THE FUTURE!

### RELIABLY HIGH YIELDS

- High efficiency solar cells together with high transmission textured glass deliver module efficiency of over 16.0%, leading to minimized installation costs and maximized system output.
- High output due to excellent performance in weak-light conditions.
- Higher specific yields due to positive power sorting.
- Product quality is assured through the use of branded components.

### QUALITY ASSURANCE

- Durability assured in even the harshest environments with AMMONIA CORROSION, SALT MIST CORROSION and FIRE TEST certifications.
- Certified to withstand increased snow and wind loads of up to 5400Pa.
- Manufacturing facility certified by ISO 9001, ISO 14001 and OHSAS 18001.
- Internal quality control with standards higher than both IEC and UL.

### WARRANTIES

- 10-year product warranty\*
- 25-year performance warranty\*
- Free module recycling through PV Cycle Association membership\*\*



CEC



\* IN COMPLIANCE WITH OUR WARRANTY TERMS AND CONDITIONS.

\*\* IN PV CYCLE MEMBER COUNTRIES ONLY, SEE: [WWW.PVCYCLE.COM](http://WWW.PVCYCLE.COM)

## MECHANICAL CHARACTERISTICS

Solar Cells	Monocrystalline 125mm x 125mm square, 6 x 12 pieces in series
Dimension	Length: 1580mm (62.2 inch)
	Width: 808mm (31.8 inch)
	Height: 35/45mm (1.4/1.8 inch)
Weight	15/16kg (33/35.3lbs)
Front Glass	3.2mm toughened glass
Frame	Anodized aluminium alloy
Cable	0.90m wire (ø4mm <sup>2</sup> )
Diodes	3 pieces Schottky by-pass diodes
Junction Box	IP 65 rated

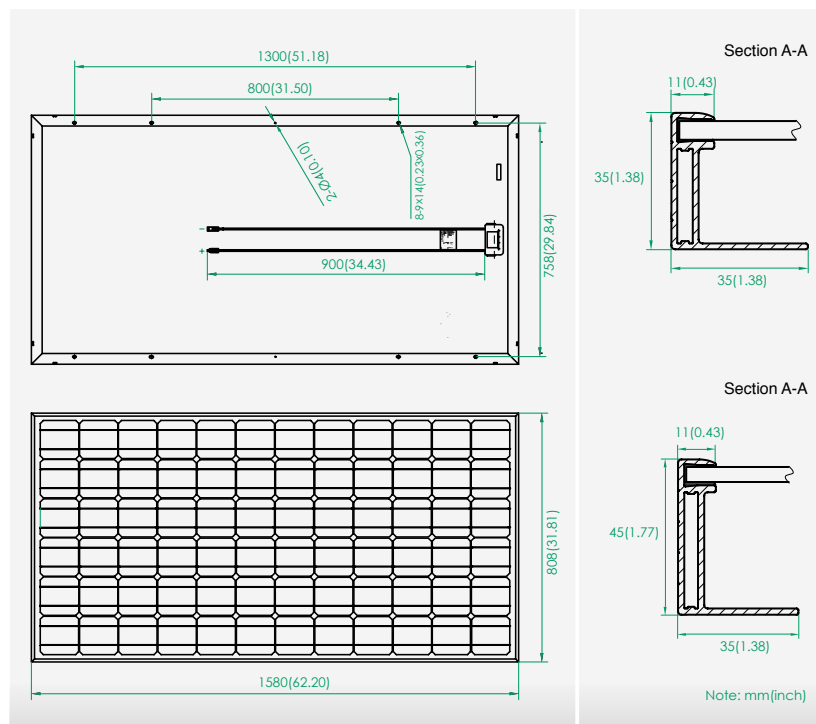
## ABSOLUTE MAXIMUM RATING

Parameter	Values
Operating Temperature	From -40 to +85°C
Typical Application	24V DC
Hail Diameter @ 80km/h	Up to 25mm
Surface Maximum Load Capacity	Up to 2400/5400Pa
Maximum Series Fuse Rating	10A
IEC Application Class (IEC 61215)	A
Fire Rating (UL 1703)	C
Maximum System Voltage	1000V DC (IEC 61215)
	1000V DC (UL 1703)

## ELECTRICAL TYPICAL VALUES<sup>1,2</sup>

Model	Rated Power (P <sub>mpp</sub> )	Tolerance	Rated Current (I <sub>mpp</sub> )	Rated Voltage (V <sub>mpp</sub> )	Short Circuit Current (I <sub>sc</sub> )	Open Circuit Voltage (V <sub>oc</sub> )	Module Efficiency (%)
PS190M-24/F	190W	0~+5W	5.14A	37.0V	5.45A	45.0V	14.88
PS195M-24/F	195W	0~+5W	5.22A	37.4V	5.50A	45.2V	15.27
PS200M-24/F	200W	0~+5W	5.30A	37.8V	5.55A	45.4V	15.67
PS205M-24/F	205W	0~+5W	5.38A	38.2V	5.60A	45.6V	16.06
PS210M-24/F	210W	0~+5W	5.46A	38.6V	5.65A	45.8V	16.45

## DIMENSIONS



## TEMPERATURE CHARACTERISTICS

NOCT (Nominal Operation Cell Temperature)	45°C ± 2°C
Voltage Temperature Coefficient	-0.3259%/K
Current Temperature Coefficient	+0.0564%/K
Power Temperature Coefficient	-0.4314%/K

## WEAK LIGHT PERFORMANCE

Intensity [W/m <sup>2</sup> ]	I <sub>mpp</sub>	V <sub>mpp</sub>
1000	1	1
800	0.8	0.996
600	0.6	0.99
400	0.4	0.983
200	0.2	0.952
100	0.1	0.921

## PACKING CONFIGURATION

Module Height	35mm		45mm	
	20' GP	40' GP	20' GP	40' GP
Container	27	27	24	24
Pieces per pallet	12	28	12	28
Pallets per container	324	756	288	672

## PARTNER INFORMATION

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 Moosfürtherstrasse 66  
 94522 Wallersdorf / Germany  
[www.alkaSOL.de](http://www.alkaSOL.de)

Note: This datasheet summarises product warranty and specifications, which are subject to change without notice. The exact module specification will be subject to the description in the sales contract. Further information can be found on our website: [www.phonosolar.com](http://www.phonosolar.com)

1. 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.
2. Measurement conditions under irradiance level of Standard Test Conditions(STC): 1000W/m<sup>2</sup>, Air mass 1.5 Spectrum, cell temperature of 25°C.