

JPO



SOLAR SOLUTIONS

Thank you for your interest and for your time that you have taken to learn more about our company. In this catalog you will find information about our products, location and purpose of the company. We are a company with a vision for the future, not only in technology, but also in a better and cleaner world.





JPO is a new company in the field of solar energy. Through our 3 years of research and development we are able to provide the market with leading quality solar panels.

We have already developed partnerships in Germany, China and Brazil making our product both accessible to our home market and internationally.

Today we can provide an assortment of configurations of solar panels with varied sizes to custom fit your personal needs.

JPO Solar Solutions is in the process of developing automation equipment for the production of solar panels. Our machines will allow us to build solar panels with accuracy and precision, while passing on the savings to our customers.

General Installation Manual for JPO Solar Solutions PV Solar Module

Please Read this manual carefully before installing the modules.

WARNING

Please read this manual completely before installing JPO module. This module produces electricity when exposed to light. Follow all applicable electrical safety precautions. Only qualified personnel should install or perform maintenance work on this module. Do not handle modules when they are wet.

INTRODUCTIONS

JPO solar Modules come in various sizes to satisfy a full range of applications. Each module is made of crystalline silicon cells. To protect the cells for the most severe environmental conditions, modules are made of high transmission rate, low iron tempered glass, anti aging encapsulation materials, and high climate resistant and insulated back sheet by hot lamination. This is framed with an anodized aluminum alloy frame and a junction box.

APPLICATIONS

Modules are a reliable, virtually maintenance free power supply; designed to operate efficiently in sunlight. Modules transform the solar radiant energy into electrical energy. Modules can be used for PV solar systems. A basic setup for a PV solar system consists of a PV solar module, controller, inverter and storage battery.

Modules can be used in roof PV solar systems, PV stations, buildings, and other electric generation applications.

CODES and REGULATIONS

The mechanical and electrical installation of PV systems should be performed in accordance with all applicable codes; including electrical codes, building codes, and electric utility interconnect requirements.

Requirements may also vary with system voltage, and for DC or AC application. Contact local authorities for governing regulations. In the U.S., all installations should conform to the National Electrical Code (NEC).



MECHANICAL INSTALLATIONS

Mounting Site

Modules can be used on land except for corrosive salt areas and sulfurous areas.

Excluded applications include, but are not limited to, installations where modules are likely to come in contact with any salt water or likely to become partially or wholly submerged in fresh or salt water; examples of which include use on boats, docks and buoys. Don't install modules in a location where it would be immersed in water or continually exposed to water from a sprinkler or fountain etc.

Modules are designed for a maximum allowable design pressure of 50 pounds per square foot, about 2400 Pa, which may correspond to a nominal wind speed of approximately 130 km/h in certain circumstances. Actual maximum allowable wind speed may be influenced by module type, mounting configuration, location, and other factors. In no case should modules be exposed to pressures greater than 50 pounds per square foot of uniformly distributed wind, snow or other loading.

Do not install modules near an open flame or flammable materials.

When choosing a site, avoid trees, buildings or obstructions. Modules should be mounted to maximize direct exposure to sunlight and to eliminate or minimize shadowing. Even partial shadowing can substantially reduce module and system output. Furthermore, partial shadowing can elevate the shaded portion's internal temperature, which may lower output and shorten module life.

ORIENTATION OF INSTALLATIONS

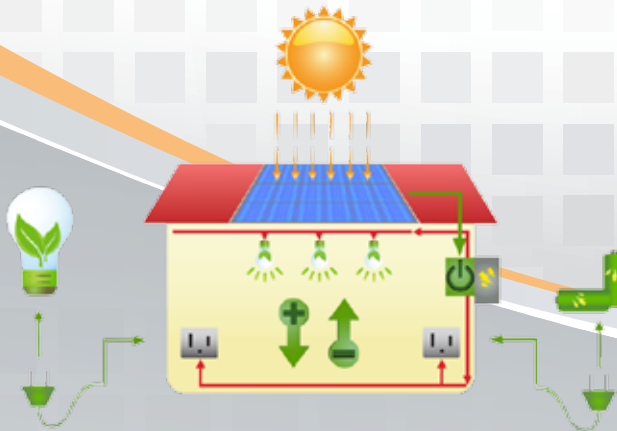
Modules may be mounted at any angle from a vertical orientation to a horizontal one. The appropriate fixed tilt angle and azimuth orientation should be used in order to maximize the exposure to sunlight.

Incorrect orientation of modules installation will result in loss of power output. Modules connected in series should be installed at same orientation and angle. Different orientation or angle may cause loss of power output due to difference of amount of sunlight exposed to the modules.

In the Northern Hemisphere, modules should face south, and in the Southern Hemisphere, modules should face north.

MODULE TILT ANGLE

Modules produce the most power when they are pointed directly at the sun. For installations where modules are mounted to a permanent structure, modules should be tilted for optimum winter performance. As a rule, if the PV system power production is adequate in the winter; it will be satisfactory during the rest of the year. The module tilt angle is measured between the modules and the ground.



MOUNTING

Use fasteners to fasten the modules to the mounting support structure. Modules should be bolted to support structures through mounting holes located in the frame's back flanges only. Eight 1/4-inch (6.35mm) stainless-steel bolts, with nuts, washers, and lock washers, are recommended for module mounting. Creation of additional holes for mounting is not recommended and will invalidate the warranty. Modules should not be mounted by supports at the ends.



Mounting support structure should withstand forces from wind and snowfall pressure etc. Mounting support structure should use proper materials and corrosive treatment.

While installing the modules, should they have proper ventilation. A clearance of 4.5 inches (about 115mm) or more behind the modules is recommended to permit air circulation and cooler module operation. Elevated temperatures lower operating voltage and power, and shorten module lifetime. Clearance of 1/4 inch (6.35mm) or more between modules is required to allow for thermal expansion of the frames.



ELECTRICAL INSTALLATIONS

Blocking diodes

Modules do not contain a blocking diode when shipped from the factory.

Blocking diodes can prevent nighttime battery discharging, prevent modules from loss of array output, and prevent modules from being damaged or destroyed by reverse current flow.

Blocking diodes should be installed in series with each module or series string to prevent possible back flow of energy through the module(s) when modules or strings are connected in parallel or used in conjunction with a battery.

Over current protection

Whenever necessary, to comply with local codes, use a fuse or circuit breaker rated for the maximum series fuse rating of the module and the system voltage.

Always fuse the connections at the battery for safety. Refer to the module-rating label (on module) for recommended fuse size. Also, refer to the charge controller owner's manual.

All electrical components should have ratings equal or greater to the system rating. Do not exceed the maximum allowable system voltage as listed on the module label.

Grounding

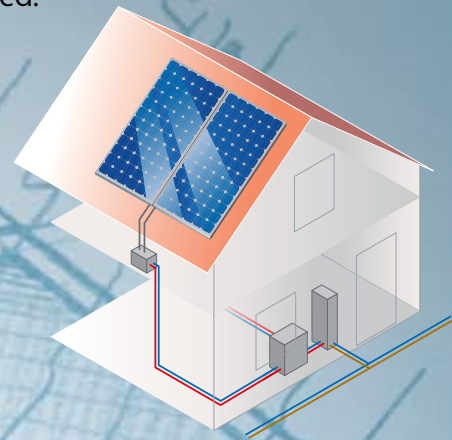
All module frames should be grounded for safety. The support structure must also be grounded unless they are



mechanically connected by nuts and bolts to the grounded modules.

Attach a separate ground wire, to grounding holes on modules frame, with a self-tapping screw. Module frame is provided with grounding holes. 1/4-inch (6.35mm) #10 stainless-steel bolts, with nuts, washers, and lock washers, are recommended for module grounding. The ground wire should be at least the same size as the electrical conductors, Ground wires greater than 10 AWG are rec-

ommended.



Wiring

Modules are equipped with factory installed wires and quick connectors. Modules have been designed to be easily interconnected in series.

One module has a pair of male and female waterproof cables and connectors for electrical connection that are pre-wired inside the junction box. The cables have obvious marks of the positive and the negative.

The connectors at the opposite end of these wires allow easy series connection of adjacent modules by firmly inserting the male connector of a module into the female connector of an adjacent module until the connector is fully seated.

For a series electrical connection, connect positive (+) connector of the first module to the negative (-) connector of the following module. For a parallel electrical connection, connect positive (+) connector of the first module to the positive (+) connector of the following module.

The cable typically used to interconnect the modules should be stranded or a solid copper, single-conductor, rated sunlight resistant. For modules and module wiring that is exposed to weather, use 12AWG (4.0mm²) or up to 14AWG (2.5mm²) gauge copper wire.

The maximum and minimum diameters of the cable that may be used with the cable connector are 8 mm and 6 mm respectively. A separate return wire or wires may be required to run the positive and negative terminations of the series string of modules to the load. Male and/or female connectors pre- attached to wires may be used at the string terminations for return wire connections and/or for source circuit box terminations. Modules have bypass diode(s) Installed.

MAINTENANCES

It is not uncommon for a remote site to be checked only once per year. Under most conditions, normal rainfall is sufficient to keep the module glass clean. If dirt build-up becomes excessive, clean the glass with a soft cloth using mild detergent and water.

Modules that are mounted, flat (0° tilt angle) should be cleaned more often, as they will not self-clean as effectively as modules mounted at a 15° tilt or greater.

It is advisable to perform periodic inspection of the modules for damage to glass, back skin, frame and support structure.

Check electrical connections for loose connections and corrosion. Check if mounting support structure and modules are loose. Check connections of cables, connectors, and grounding.

Change modules must be the same kind and type, if need. Modules can operate effectively without ever being washed, although removal of dirt from the front glass can increase output. The glass can be washed with a wet sponge or cloth.

SAFETY PRECAUTIONS

Qualified personnel should perform module installation and operation only. Children should not be allowed near the solar electric installation.

Avoid electrical hazards when installing, wiring, operating and maintaining the module.

Modules produce DC electricity when exposed to light and therefore can produce an electrical shock or burn. Modules produce voltage even when not connected to an electrical circuit or load. Modules produce nearly full voltage when exposed to as little as 5% of full sunlight and both current and power increase with light intensity. Do not touch live parts of cables and connectors. As an added precaution, use insulated tools and rubber gloves when working with modules in sunlight.

Fall of modules from high place will cause death, injury or damage. Do not drop module or allow objects to fall on module. Never leave a module unsupported or unsecured. If a module should fall, the glass can break. A module with broken glass cannot be repaired and must not be used.

When installing or working with module or wiring, cover module face completely with opaque material

to halt production of electricity. Modules have no on/off switch. Modules when exposed to sunlight generate high voltage and are dangerous. Modules can be rendered inoperative only by removing them from sunlight, or by fully covering the front surface with opaque cloth, cardboard, or other completely opaque material, or by working with modules face down on a smooth, flat surface when installing or maintaining.

Do not artificially concentrate sunlight on the module. Modules can produce higher output than the rated specifications. Industry standard ratings are made at conditions of 1000 W/m² and 25°C cell temperature. Reflection from snow or water can increase sunlight and therefore boost current and power. In addition, colder temperatures can substantially increase voltage and power.



Modules are intended for use in terrestrial applications only, thus excluding aerospace or maritime conditions or use with sunlight concentration.

It is recommended that the module remains packed in the box until time of installation.

Work only under dry conditions, with a dry module and tools. Since sparks may be produced, do not install module where flammable gases or vapors are present.

Do not drill holes into module frame, as it will void warranty. Modules are constructed with tempered glass, but still must be handled with care. If the front glass is broken or if the polymer back skin is torn, contact with any module surface or the frame can produce electrical shock, particularly when the module is wet. Broken or damaged modules must be disposed of properly. Do not disassemble; bend impact by sharp objects, walk on, and throw or drop etc. Keep back surface free from foreign objects. Avoid sharp edges.

Use module for its intended function only. Follow all module manufacturers instructions. Do not disassemble the module, or remove any part or label installed by the manufacturer: Do not treat the back of the module with paint or adhesives.

If not otherwise specified, it is recommended that requirements of the latest local, national or regional electrical codes be followed.

Retain this installation manual for future reference.

We are located in Charlotte, North Carolina. Charlotte is a promising city with a great interest in alternative energy.

Charlotte has become a financial center of the USA. It is now the second largest center in the United States, after New York. The largest financial institute, Bank of America, considers Charlotte home. The city was the former home of the corporation Wachovia, until being bought by Wells Fargo in 2008. Wells Fargo is in the integration process with Wachovia. This full conversion will be completed toward the end of 2011. After 2011, Charlotte will be the east coast headquarters of Wells Fargo Bank. The headquarters of the Bank of America, along with other regional banks and companies of the financial industry, are located in the downtown, creating a well known financial district.

Charlotte is also the center for American motorsports. NASCAR has many offices around the city as well as the headquarters in downtown Charlotte. Approximately 75% of NASCAR officers are within two hours of downtown.



USA

We have been developing our automation machines and techniques in Brazil. This country has been growing very quickly in the last few years, and is the largest national economy of Latin America and the eighth largest in the world.

Associated with students of automation engineering, we are developing automation equipment that will facilitate the production of solar panels, with the objective of increasing production, minimizing problems, and maximizing the performance of the solar panels.



BRAZIL

During the research and development we visited and consulted in Germany. It is the largest European economy and the world pioneer of solar energy. Germany is the home of the largest companies in the area of alternative energy.

Germany also has a very important role in the development of automation, being a country with more mathematicians and engineers that contributed to the development of the science and technology.

Today we have relationships with research companies and development companies in the area of solar energy and of automation, facilitating our development and growth.



GERMANY



CHINA

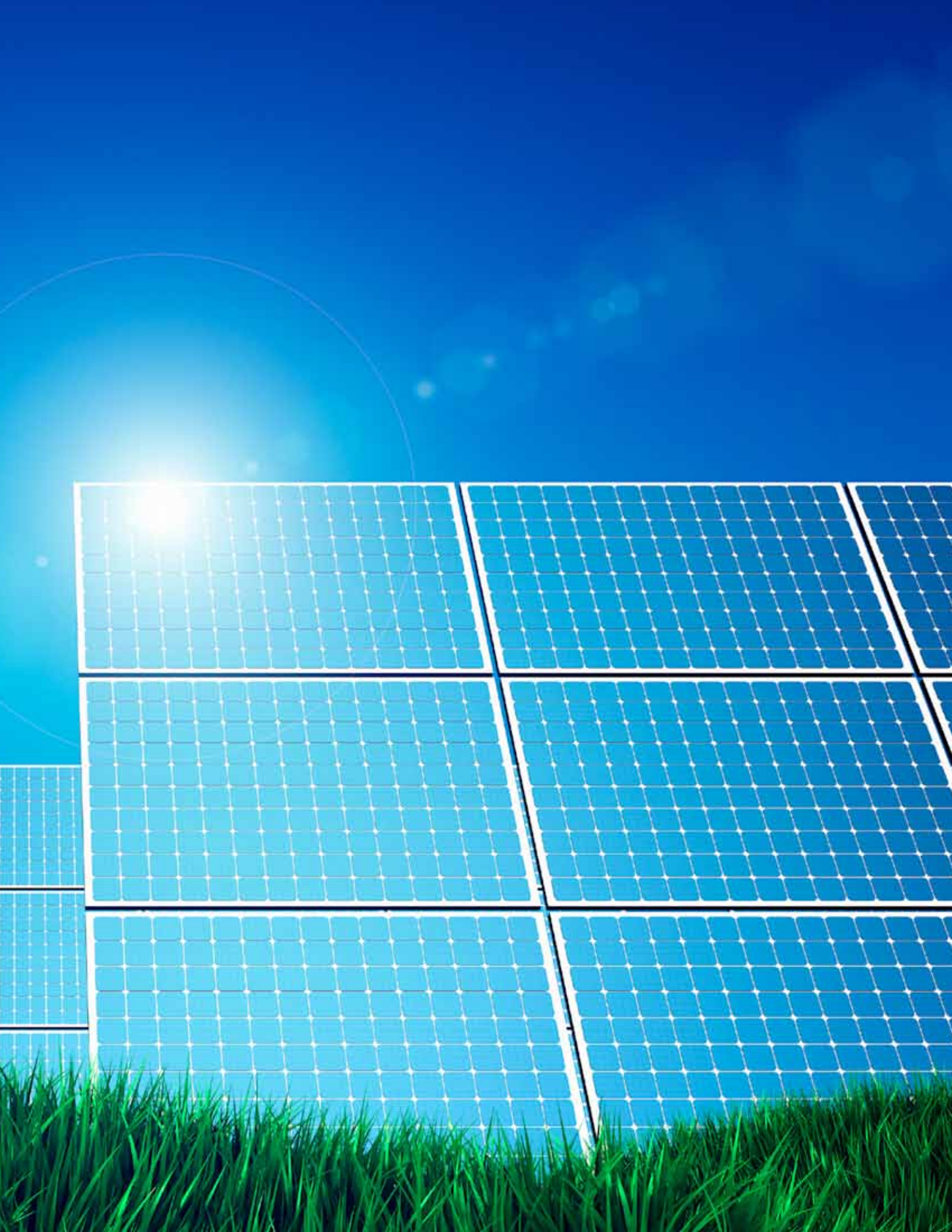
China is our market for the assembly and accessories for our products. China has the most economic growth than any other country in the world. The average economic growth in the last year was almost 10%, more than the largest world markets.

With the fast growing economy of China, we can to obtain products with more quality and lower prices. China is now dominating the world's imports.



SOLAR SOLUTIONS FOR A BETTER WORLD





Solar Module JPO-5M

Technical Data

Type	JPO5M
Type of Solar Cell	Mono-crystalline, 125 mm x 125 mm
Number of Cells	36 pcs (62.5 x 15.62)
Size of Module	217 x 307 x 25 mm (125 x 125 mm cell)
Module, Weight	1.0 kg
Connector/Cross-Section	Cixi Renhe
Cables, Length (+/-)	Customizable
Front Cover Glass	Safety Glass
Font Cover Glass, Thickness	3.2 mm
Frame	Anodized Aluminium

Electrical Data

Maximum Power	$P_{MPP,STC}$	5 W
Power Tolerance	Δ_{STC}	+/- 2%
Maximum Power Voltage	$U_{MPP,STC}$	17.6 V
Maximum power Current	$I_{MPP,STC}$	0.28 V
Open Circuit Voltage	$U_{OC,STC}$	21.8 V
Short Circuit Current	$I_{SC,STC}$	0.31 A
Cell Efficiency	η_{STC}	14.9 %
Maximum System Voltage	U_{DC}	700 V

STC: Irradiance 1000 W/m²; Spectrum AM 1,5; Cell Temperature 25°C, Wind 0 m/s

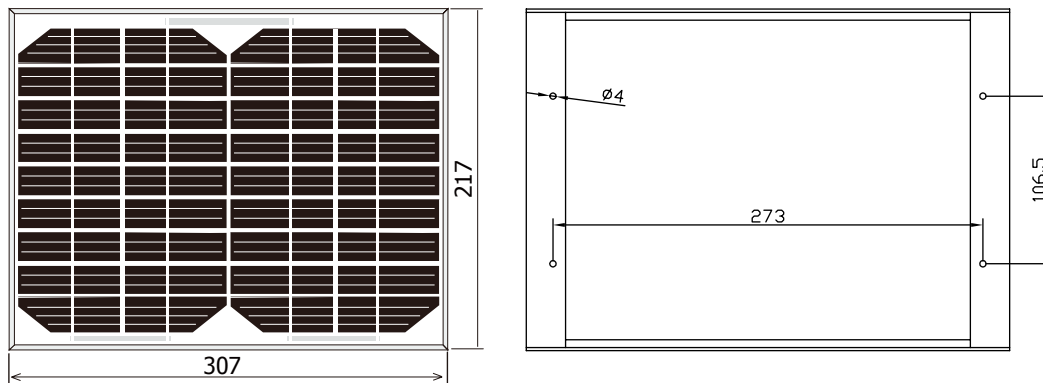
Temperature Coefficients

Power Coefficient	$\alpha_k (P_{MPP})$	-0.45 %/K
Voltage Coefficient	$\beta_k (U_{OC})$	-0.35 %/K
Current Coefficient	$\varphi_k (I_{SC})$	0.065 +/-0.015 %/K

Power Warranty

10 years performance warranty to 90 %
25 years performance warranty to 80 %
5 years warranty against production and material defects

Engineering Drawing



Solar Module JPO-10M

Technical Data

Type	JPO10M
Type of Solar Cell	Mono-crystalline, 125 mm x 125 mm
Number of Cells	36 pcs (62.5 x 31.25)
Size of Module	369 x 311 x 25 mm (125 x 125 mm cell)
Module, Weight	2.0 kg
Connector/Cross-Section	Cixi Renhe
Cables, Length (+/-)	Customizable
Front Cover Glass	Safety Glass
Font Cover Glass, Thickness	3.2 mm
Frame	Anodized Aluminium

Electrical Data

Maximum Power	$P_{MPP,STC}$	10 W
Power Tolerance	Δ_{STC}	+/- 2%
Maximum Power Voltage	$U_{MPP,STC}$	17.6 V
Maximum power Current	$I_{MPP,STC}$	0.57 V
Open Circuit Voltage	$U_{OC,STC}$	21.8 V
Short Circuit Current	$I_{SC,STC}$	0.62 A
Cell Efficiency	η_{STC}	14.9 %
Maximum System Voltage	U_{DC}	700 V

STC: Irradiance 1000 W/m²; Spectrum AM 1,5; Cell Temperature 25°C, Wind 0 m/s

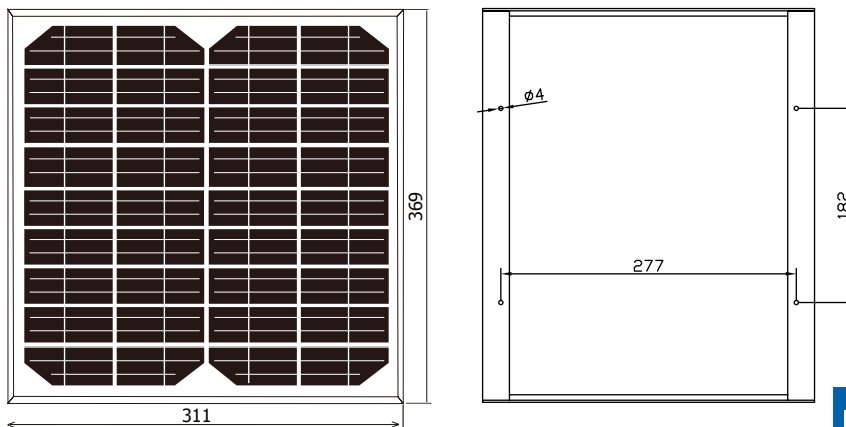
Temperature Coefficients

Power Coefficient	$\alpha_k (P_{MPP})$	-0.45 %/K
Voltage Coefficient	$\beta_k (U_{OC})$	-0.35 %/K
Current Coefficient	$\varphi_k (I_{SC})$	0.065 +/-0.015 %/K

Power Warranty

10 years performance warranty to 90 %
25 years performance warranty to 80 %
5 years warranty against production and material defects

Engineering Drawing



Solar Module JPO-15M

Technical Data

Type	JPO15M
Type of Solar Cell	Mono-crystalline, 125 mm x 125 mm
Number of Cells	36 pcs (20.8 x 12.5)
Size of Module	445 x 296 x 25 mm (125 x 125 mm cell)
Module, Weight	2.5 kg
Connector/Cross-Section	Cixi Renhe
Cables, Length (+/-)	Customizable
Front Cover Glass	Safety Glass
Font Cover Glass, Thickness	3.2 mm
Frame	Anodized Aluminium

Electrical Data

Maximum Power	$P_{MPP,STC}$	15 W
Power Tolerance	Δ_{STC}	+/- 2%
Maximum Power Voltage	$U_{MPP,STC}$	16.8 V
Maximum power Current	$I_{MPP,STC}$	0.89 V
Open Circuit Voltage	$U_{OC,STC}$	21.0 V
Short Circuit Current	$I_{SC,STC}$	1.02 A
Cell Efficiency	η_{STC}	16.8 %
Maximum System Voltage	U_{DC}	700 V

STC: Irradiance 1000 W/m²; Spectrum AM 1,5; Cell Temperature 25°C, Wind 0 m/s

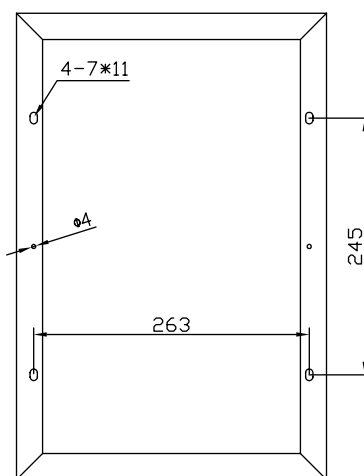
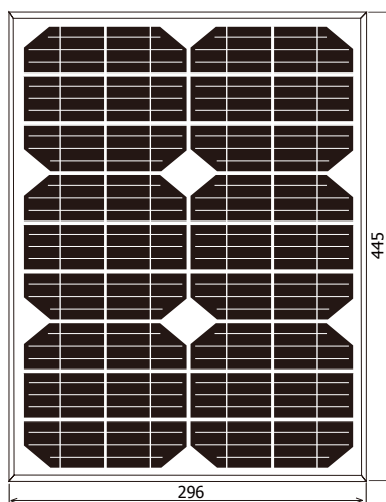
Temperature Coefficients

Power Coefficient	$\alpha_k (P_{MPP})$	-0.45 %/K
Voltage Coefficient	$\beta_k (U_{OC})$	-0.35 %/K
Current Coefficient	$\varphi_k (I_{SC})$	0.065 +/-0.015 %/K

Power Warranty

10 years performance warranty to 90 %
25 years performance warranty to 80 %
5 years warranty against production and material defects

Engineering Drawing



Solar Module JPO-20M

Technical Data

Type	JPO20M
Type of Solar Cell	Mono-crystalline, 125 mm x 125 mm
Number of Cells	36 pcs (31.25 x 12.5)
Size of Module	650 x 296 x 25 mm (125 x 125 mm cell)
Module, Weight	2.5 kg
Connector/Cross-Section	PV Applicable
Cables, Length (+/-)	Customizable
Front Cover Glass	Safety Glass
Font Cover Glass, Thickness	3.2 mm
Frame	Anodized Aluminium

Electrical Data

Maximum Power	$P_{MPP,STC}$	20 W
Power Tolerance	Δ_{STC}	+/- 3%
Maximum Power Voltage	$U_{MPP,STC}$	17.93 V
Maximum power Current	$I_{MPP,STC}$	1.12 V
Open Circuit Voltage	$U_{OC,STC}$	22.02 V
Short Circuit Current	$I_{SC,STC}$	1.23 A
Cell Efficiency	η_{STC}	14.9 %
Maximum System Voltage	U_{DC}	700 V

STC: Irradiance 1000 W/m²; Spectrum AM 1,5; Cell Temperature 25°C, Wind 0 m/s

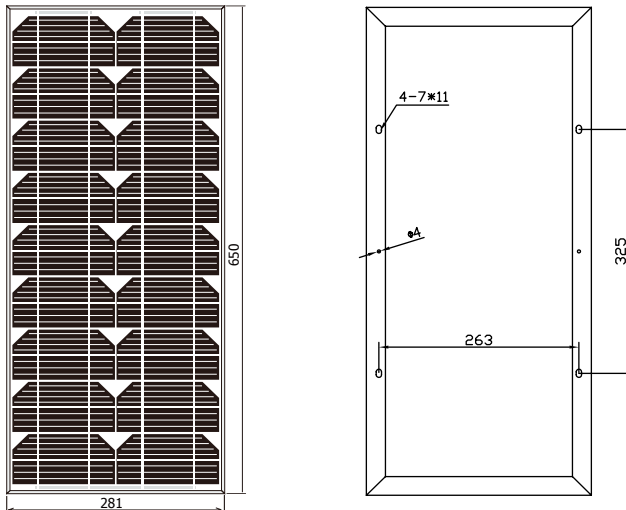
Temperature Coefficients

Power Coefficient	$\alpha_k (P_{MPP})$	-0.45 %/K
Voltage Coefficient	$\beta_k (U_{OC})$	-0.35 %/K
Current Coefficient	$\varphi_k (I_{SC})$	0.065+/-0.015 %/K

Power Warranty

10 years performance warranty to 90 %
25 years performance warranty to 80 %
5 years warranty against production and material defects

Engineering Drawing



Solar Module JPO-25M/30M

Technical Data

Type	JPO25M, JPO30M
Type of Solar Cell	Mono-crystalline, 125 mm x 125 mm
Number of Cells	36 pcs (41.7 x 12.5)
Size of Module	445 x 550 x 30 mm (125 x 125 mm cell)
Module, Weight	3.5 kg
Connector/Cross-Section	Cixi Renhe
Cables, Length (+/-)	Customizable
Front Cover Glass	Safety Glass
Font Cover Glass, Thickness	3.2 mm
Frame	Anodized Aluminium

Electrical Data

Maximum Power	$P_{MPP, STC}$	25 W	30 W
Power Tolerance	Δ_{STC}	+/- 2%	+/- 2%
Maximum Power Voltage	$U_{MPP, STC}$	17 V	18 V
Maximum power Current	$I_{MPP, STC}$	1.47 A	1.67 A
Open Circuit Voltage	$U_{OC, STC}$	21.2 V	22.4 V
Short Circuit Current	$I_{SC, STC}$	1.64 A	1.77 A
Cell Efficiency	η_{STC}	14.0 %	16.8 %
Maximum System Voltage	U_{DC}	700 V	700 V

STC: Irradiance 1000 W/m²; Spectrum AM 1,5; Cell Temperature 25°C, Wind 0 m/s

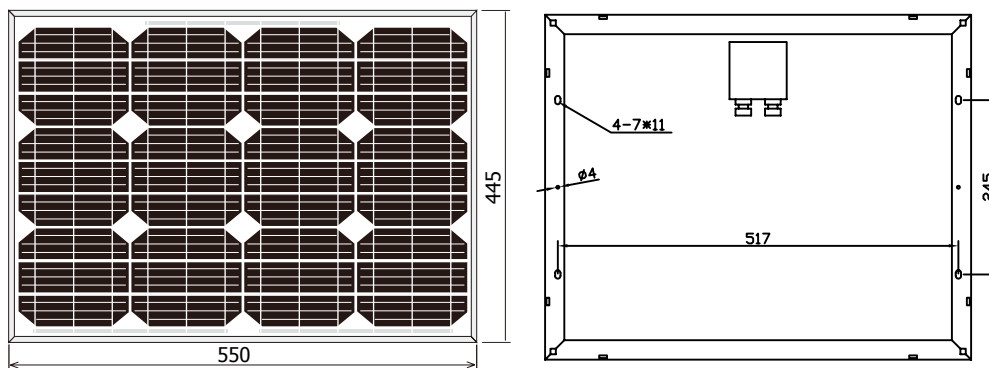
Temperature Coefficients

Power Coefficient	$\alpha_k (P_{MPP})$	-0.45 %/K
Voltage Coefficient	$\beta_k (U_{OC})$	-0.35 %/K
Current Coefficient	$\varphi_k (I_{SC})$	0.065 +/- 0.015 %/K

Power Warranty

10 years performance warranty to 90 %
25 years performance warranty to 80 %
5 years warranty against production and material defects

Engineering Drawing



Solar Module JPO-35M/40M/45M

Technical Data

Type	JPO35M, JPO40M, JPO45M
Type of Solar Cell	Mono-crystalline, 125 mm x 125 mm
Number of Cells	36 pcs (62.5 x 12.5)
Size of Module	632 x 550 x 30 mm (125 x 125 mm cell)
Module, Weight	4.5 kg
Connector/Cross-Section	Cixi Renhe
Cables, Length (+/-)	Customizable
Front Cover Glass	Safety Glass
Font Cover Glass, Thickness	3.2 mm
Frame	Anodized Aluminium

Electrical Data

Maximum Power	$P_{MPP,STC}$	35 W	40 W	45 W
Power Tolerance	Δ_{STC}	+/- 2%	+/- 2%	+/- 2%
Maximum Power Voltage	$U_{MPP,STC}$	17.0 V	17.2 V	18.0 V
Maximum power Current	$I_{MPP,STC}$	2.06 A	2.33 A	2.50 A
Open Circuit Voltage	$U_{OC,STC}$	21.2 V	21.4 V	22.4 V
Short Circuit Current	$I_{SC,STC}$	2.29 A	2.50 A	2.65 A
Cell Efficiency	η_{STC}	13.1 %	14.9 %	16.8 %
Maximum System Voltage	U_{DC}	700 V	700 V	700 V

STC: Irradiance 1000 W/m²; Spectrum AM 1,5; Cell Temperature 25°C, Wind 0 m/s

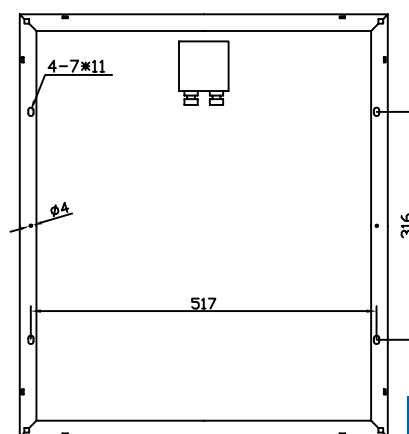
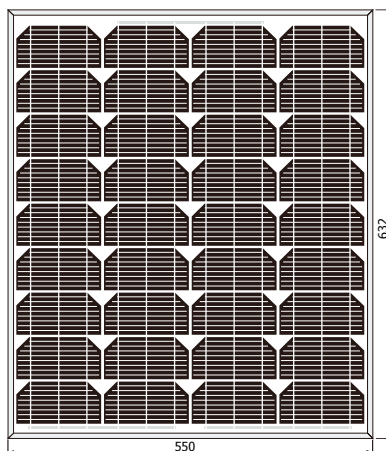
Temperature Coefficients

Power Coefficient	$\alpha_k (P_{MPP})$	-0.45 %/K
Voltage Coefficient	$\beta_k (U_{OC})$	-0.35 %/K
Current Coefficient	$\varphi_k (I_{SC})$	0.065 +/- 0.015 %/K

Power Warranty

10 years performance warranty to 90 %
25 years performance warranty to 80 %
5 years warranty against production and material defects

Engineering Drawing



Solar Module JPO-50M/55M/60M

Technical Data

Type	JPO50M, JPO55M, JPO60M
Type of Solar Cell	Mono-crystalline, 125 mm x 125 mm
Number of Cells	72 pcs (41.7 x 12.5)
Size of Module	820 x 550 x 30 mm (125 x 125 mm cell)
Module, Weight	5.5 kg
Connector/Cross-Section	Cixi Renhe
Cables, Length (+/-)	Customizable
Front Cover Glass	Safety Glass
Font Cover Glass, Thickness	3.2 mm
Frame	Anodized Aluminium

Electrical Data

Maximum Power	$P_{MPP,STC}$	50 W	55 W	60 W
Power Tolerance	Δ_{STC}	+/- 2%	+/- 2%	+/- 2%
Maximum Power Voltage	$U_{MPP,STC}$	17.0 V	17.2 V	18.0 V
Maximum power Current	$I_{MPP,STC}$	2.94 A	3.20 A	3.33 A
Open Circuit Voltage	$U_{OC,STC}$	21.25 V	21.5 V	22.5 V
Short Circuit Current	$I_{SC,STC}$	3.14 A	3.41 A	3.55 A
Cell Efficiency	η_{STC}	14.0 %	15.4 %	16.8 %
Maximum System Voltage	U_{DC}	700 V	700 V	700 V

STC: Irradiance 1000 W/m²; Spectrum AM 1,5; Cell Temperature 25°C, Wind 0 m/s

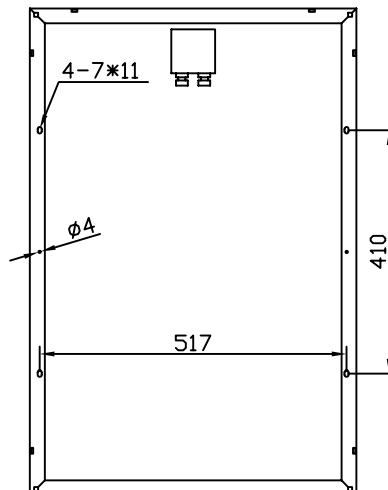
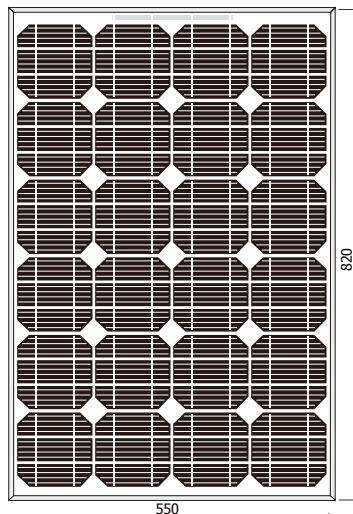
Temperature Coefficients

Power Coefficient	$\alpha_p (P_{MPP})$	-0.45 %/K
Voltage Coefficient	$\beta_v (U_{OC})$	-0.35 %/K
Current Coefficient	$\varphi_k (I_{SC})$	0.065 +/- 0.015 %/K

Power Warranty

10 years performance warranty to 90 %
25 years performance warranty to 80 %
5 years warranty against production and material defects

Engineering Drawing



Solar Module JPO-65M/70M

Technical Data

Type	JPO65M, JPO70M
Type of Solar Cell	Mono-crystalline, 125 mm x 125 mm
Number of Cells	36 pcs
Size of Module	1195 x 550 x 30 mm (125 x 125 mm cell)
Module, Weight	8 kg
Connector/Cross-Section	Cixi Renhe
Cables, Length (+/-)	Customizable
Front Cover Glass	Safety Glass
Font Cover Glass, Thickness	3.2 mm
Frame	Anodized Aluminium

Electrical Data

Maximum Power	$P_{MPP, STC}$	65 W	70 W
Power Tolerance	Δ_{STC}	+/- 2%	+/- 2%
Maximum Power Voltage	$U_{MPP, STC}$	17 V	17 V
Maximum power Current	$I_{MPP, STC}$	3.82 A	4.12 A
Open Circuit Voltage	$U_{OC, STC}$	21.1 V	21.2 V
Short Circuit Current	$I_{SC, STC}$	4.27 A	4.59 A
Cell Efficiency	η_{STC}	12.2 %	13.1 %
Maximum System Voltage	U_{DC}	700 V	700 V

STC: Irradiance 1000 W/m²; Spectrum AM 1,5; Cell Temperature 25°C, Wind 0 m/s

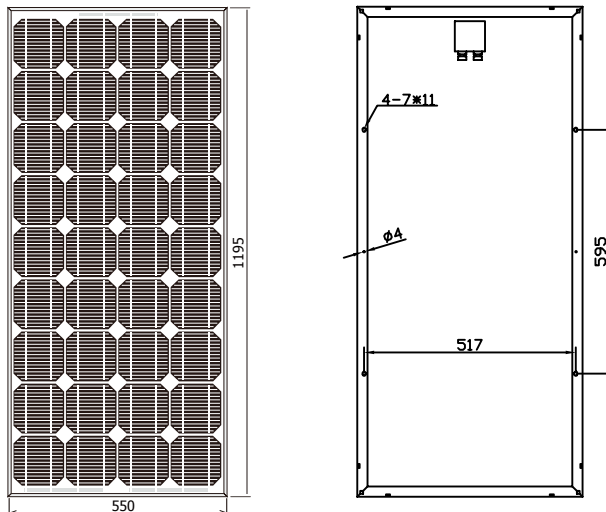
Temperature Coefficients

Power Coefficient	$\alpha_k (P_{MPP})$	-0.45 %/K
Voltage Coefficient	$\beta_k (U_{OC})$	-0.35 %/K
Current Coefficient	$\varphi_k (I_{SC})$	0.065 +/- 0.015 %/K

Power Warranty

10 years performance warranty to 90 %
25 years performance warranty to 80 %
5 years warranty against production and material defects

Engineering Drawing



Solar Module JPO-75M/80M

Technical Data

Type	JPO75M, JPO80M
Type of Solar Cell	Mono-crystalline, 125 mm x 125 mm
Number of Cells	36 pcs
Size of Module	1195 x 550 x 30 mm (125 x 125 mm cell)
Module, Weight	8 kg
Connector/Cross-Section	Cixi Renhe
Cables, Length (+/-)	Customizable
Front Cover Glass	Safety Glass
Font Cover Glass, Thickness	3.2 mm
Frame	Anodized Aluminium

Electrical Data

Maximum Power	$P_{MPP, STC}$	75 W	80 W
Power Tolerance	Δ_{STC}	0 ~ + 2%	0 ~ + 2%
Maximum Power Voltage	$U_{MPP, STC}$	17.2 V	17.2 V
Maximum power Current	$I_{MPP, STC}$	4.36 A	4.65 A
Open Circuit Voltage	$U_{OC, STC}$	21.2 V	21.4 V
Short Circuit Current	$I_{SC, STC}$	4.91 A	4.99 A
Cell Efficiency	η_{STC}	14.0 %	14.9 %
Maximum System Voltage	U_{DC}	700 V	700 V

STC: Irradiance 1000 W/m²; Spectrum AM 1,5; Cell Temperature 25°C, Wind 0 m/s

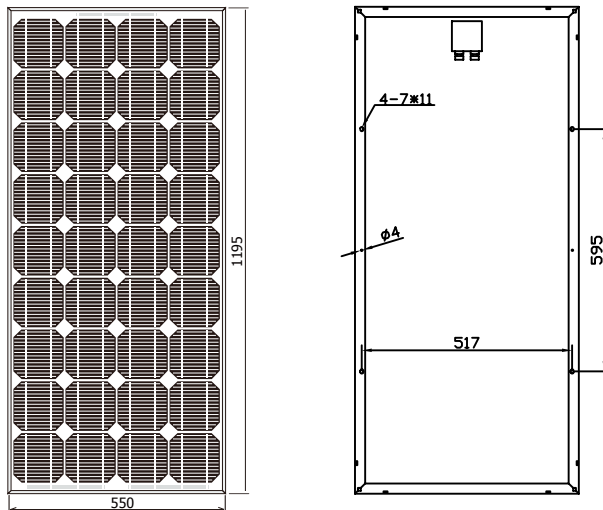
Temperature Coefficients

Power Coefficient	$\alpha_k (P_{MPP})$	-0.45 %/K
Voltage Coefficient	$\beta_k (U_{OC})$	-0.35 %/K
Current Coefficient	$\varphi_k (I_{SC})$	0.065 +/- 0.015 %/K

Power Warranty

10 years performance warranty to 90 %
25 years performance warranty to 80 %
5 years warranty against production and material defects

Engineering Drawing



Solar Module JPO-85M/90M/95M

Technical Data

Type	JPO85M, JPO90M, JPO95M
Type of Solar Cell	Mono-crystalline, 125 mm x 125 mm
Number of Cells	36 pcs
Size of Module	1195 x 550 x 30 mm (125 x 125 mm cell)
Module, Weight	8 kg
Connector/Cross-Section	Cixi Renhe
Cables, Length (+/-)	Customizable
Front Cover Glass	Safety Glass
Font Cover Glass, Thickness	3.2 mm
Frame	Anodized Aluminium

Electrical Data

Maximum Power	$P_{MPP,STC}$	85 W	90 W	95 W
Power Tolerance	Δ_{STC}	+/- 2%	+/- 2%	+/- 2%
Maximum Power Voltage	$U_{MPP,STC}$	17.4 V	17.6 V	17.8 V
Maximum power Current	$I_{MPP,STC}$	4.89 A	5.11 A	5.33 A
Open Circuit Voltage	$U_{OC,STC}$	21.6 V	21.8 V	22.2 V
Short Circuit Current	$I_{SC,STC}$	5.25 A	5.51 A	5.79 A
Cell Efficiency	η_{STC}	15.9 %	16.8 %	17.8 %
Maximum System Voltage	U_{DC}	700 V	700 V	700 V

STC: Irradiance 1000 W/m²; Spectrum AM 1,5; Cell Temperature 25°C, Wind 0 m/s

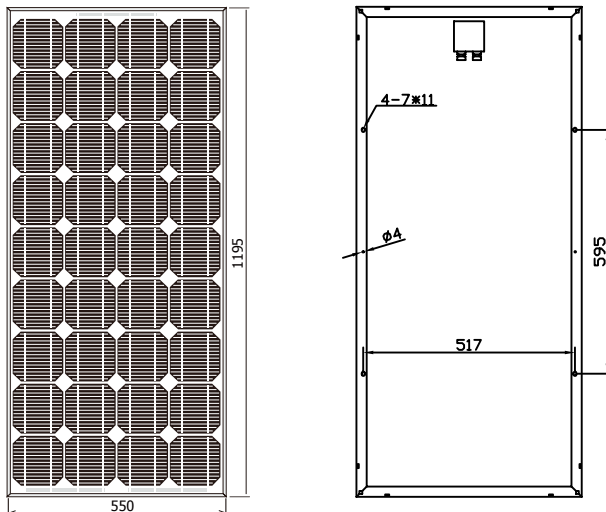
Temperature Coefficients

Power Coefficient	$\alpha_k (P_{MPP})$	-0.45 %/K
Voltage Coefficient	$\beta_k (U_{OC})$	-0.35 %/K
Current Coefficient	$\varphi_k (I_{SC})$	0.065 +/-0.015 %/K

Power Warranty

- 10 years performance warranty to 90 %
- 25 years performance warranty to 80 %
- 5 years warranty against production and material defects

Engineering Drawing



Solar Module JPO-160M/165M/170M

Technical Data

Type	JPO160M, JPO165M, JPO170M
Type of Solar Cell	Mono-crystalline, 125 mm x 125 mm
Number of Cells	72 pcs
Size of Module	1580 x 808 x 45 mm (125 x 125 mm cell)
Module, Weight	15.5 kg
Connector/Cross-Section	Cixi Renhe
Cables, Length (+/-)	900 mm
Front Cover Glass	Safety Glass
Font Cover Glass, Thickness	3.2 mm
Frame	Anodized Aluminium

Electrical Data

Maximum Power	$P_{MPP\ STC}$	160 W	165 W	170 W
Power Tolerance	Δ_{STC}	0 ~ + 3%	0 ~ + 3%	0 ~ + 3%
Maximum Power Voltage	$U_{MPP\ STC}$	35.0 V	35.2 V	35.2 V
Maximum power Current	$I_{MPP\ STC}$	4.57 A	4.69 A	4.83 A
Open Circuit Voltage	$U_{OC\ STC}$	43.2 V	43.6 V	43.6 V
Short Circuit Current	$I_{SC\ STC}$	5.10 A	5.15 A	5.20 A
Cell Efficiency	η_{STC}	14.9 %	15.4 %	15.9 %
Maximum System Voltage	U_{DC}	700 V	700 V	700 V

STC: Irradiance 1000 W/m²; Spectrum AM 1,5; Cell Temperature 25°C, Wind 0 m/s

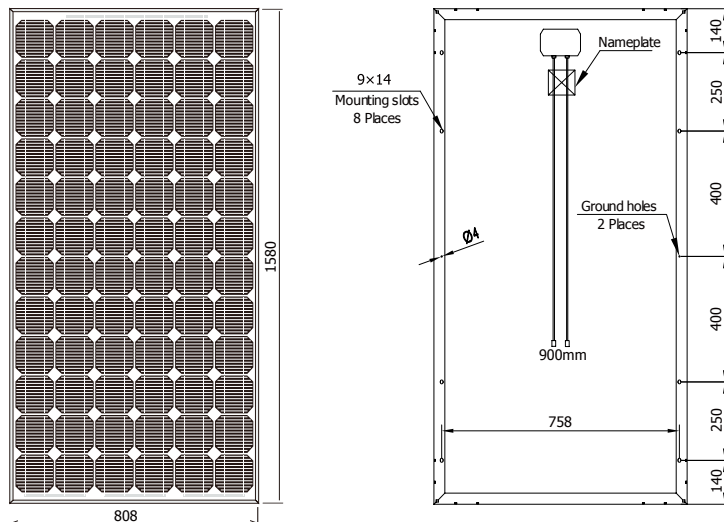
Temperature Coefficients

Power Coefficient	$\alpha_k (P_{MPP})$	-0.45 %/K
Voltage Coefficient	$\beta_k (U_{OC})$	-0.35 %/K
Current Coefficient	$\varphi_k (I_{SC})$	0.065 +/-0.015 %/K

Power Warranty

10 years performance warranty to 90 %
25 years performance warranty to 80 %
5 years warranty against production and material defects

Engineering Drawing



Certifications:
IEC 61215, IEC 61730, TUV, CE, ISO9001:2000



Solar Module JPO-175M/180M

Technical Data

Type	JPO175M, JPO180M
Type of Solar Cell	Mono-crystalline, 125 mm x 125 mm
Number of Cells	72 pcs
Size of Module	1580 x 808 x 45 mm (125 x 125 mm cell)
Module, Weight	15.5 kg
Connector/Cross-Section	Cixi Renhe
Cables, Length (+/-)	900 mm
Front Cover Glass	Safety Glass
Font Cover Glass, Thickness	3.2 mm
Frame	Anodized Aluminium

Electrical Data

Maximum Power	$P_{MPP, STC}$	175 W	180 W
Power Tolerance	Δ_{STC}	0 ~ + 3%	0 ~ + 3%
Maximum Power Voltage	$U_{MPP, STC}$	35.2 V	36.0 V
Maximum power Current	$I_{MPP, STC}$	4.95 A	5.00 A
Open Circuit Voltage	$U_{OC, STC}$	44.2 V	44.8 V
Short Circuit Current	$I_{SC, STC}$	5.20 A	5.29 A
Cell Efficiency	η_{STC}	16.36 %	16.82 %
Maximum System Voltage	U_{DC}	1000 V	1000 V

STC: Irradiance 1000 W/m²; Spectrum AM 1,5; Cell Temperature 25°C, Wind 0 m/s

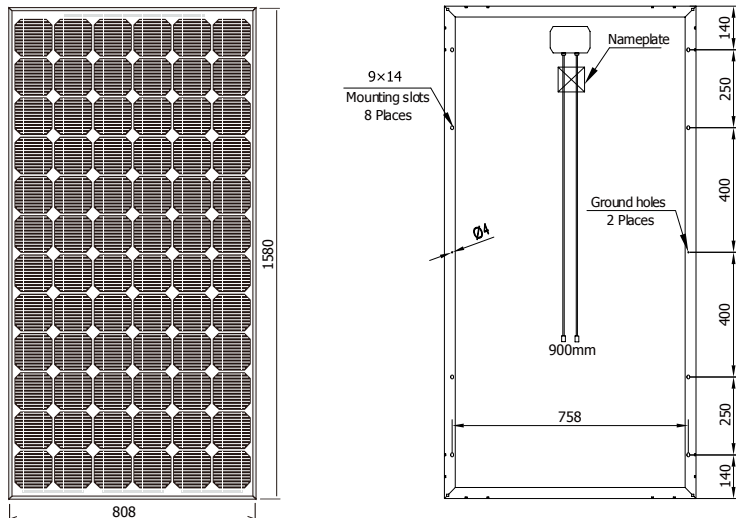
Temperature Coefficients

Power Coefficient	$\alpha_k (P_{MPP})$	-0.45 %/K
Voltage Coefficient	$\beta_k (U_{OC})$	-0.35 %/K
Current Coefficient	$\varphi_k (I_{SC})$	0.065 +/- 0.015 %/K

Power Warranty

10 years performance warranty to 90 %
25 years performance warranty to 80 %
5 years warranty against production and material defects

Engineering Drawing



Certifications:
IEC 61215, IEC 61730, TUV, CE, ISO9001:2000



Solar Module JPO-185M/190M

Technical Data

Type	JPO185M, JPO190M
Type of Solar Cell	Mono-crystalline, 125 mm x 125 mm
Number of Cells	72 pcs
Size of Module	1580 x 808 x 30 mm (125 x 125 mm cell)
Module, Weight	15 kg
Connector/Cross-Section	Cixi Renhe
Cables, Length (+/-)	900 mm
Front Cover Glass	Safety Glass
Font Cover Glass, Thickness	3.2 mm
Frame	Anodized Aluminium

Electrical Data

Maximum Power	$P_{MPP, STC}$	185 W	190 W
Power Tolerance	Δ_{STC}	+/- 2%	+/-2%
Maximum Power Voltage	$U_{MPP, STC}$	35.4 V	35.6 V
Maximum power Current	$I_{MPP, STC}$	5.23 A	5.34 A
Open Circuit Voltage	$U_{OC, STC}$	44.0 V	44.2 V
Short Circuit Current	$I_{SC, STC}$	5.61 A	5.77 A
Cell Efficiency	η_{STC}	17.3 %	17.7 %
Maximum System Voltage	U_{DC}	1000 V	1000 V

STC: Irradiance 1000 W/m²; Spectrum AM 1,5; Cell Temperature 25°C, Wind 0 m/s

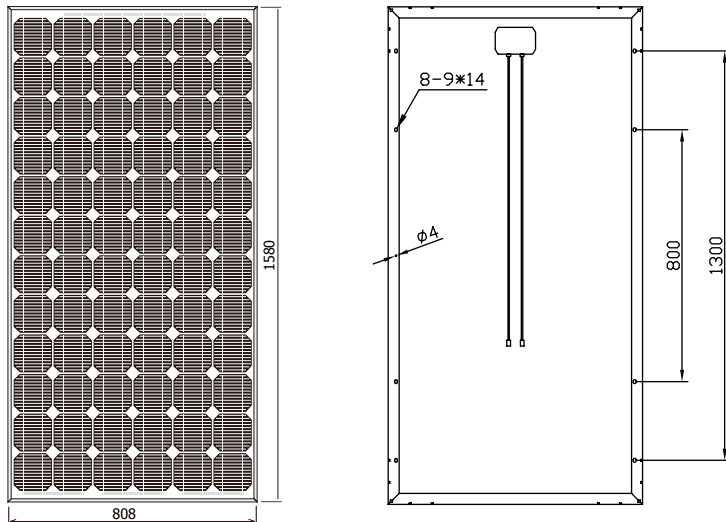
Temperature Coefficients

Power Coefficient	$\alpha_p (P_{MPP})$	-0.45 %/K
Voltage Coefficient	$\beta_u (U_{OC})$	-0.35 %/K
Current Coefficient	$\varphi_k (I_{SC})$	0.065 +/-0.015 %/K

Power Warranty

10 years performance warranty to 90 %
25 years performance warranty to 80 %
5 years warranty against production and material defects

Engineering Drawing



Certifications:
IEC 61215, IEC 61730, TUV, CE, ISO9001:2000



Solar Module JPO-210M/220M/230M

Technical Data

Type	JPO210M, JPO220M, JPO230M
Type of Solar Cell	Mono-crystalline, 125 mm x125 mm
Number of Cells	88 pcs
Size of Module	1462 x 1064 x 30 mm (125 x 125 mm cell)
Module, Weight	18 kg
Connector/Cross-Section	Cixi Renhe
Cables, Length (+/-)	900 mm
Front Cover Glass	Safety Glass
Font Cover Glass, Thickness	3.2 mm
Frame	Anodized Aluminium

Electrical Data

Maximum Power	$P_{MPP,STC}$	210 W	220 W	230 W
Power Tolerance	Δ_{STC}	+/- 2%	+/- 2%	+/- 2%
Maximum Power Voltage	$U_{MPP,STC}$	43.5 V	44.0 V	44.0 V
Maximum power Current	$I_{MPP,STC}$	4.83 A	5.00 A	5.23 A
Open Circuit Voltage	$U_{OC,STC}$	54.3 V	54.8 V	54.8 V
Short Circuit Current	$I_{SC,STC}$	5.16 A	5.28 A	5.53 A
Cell Efficiency	η_{STC}	16.06 %	16.83 %	16.9 %
Maximum System Voltage	U_{DC}	1000 V	1000 V	1000 V

STC: Irradiance 1000 W/m²; Spectrum AM 1,5; Cell Temperature 25°C, Wind 0 m/s

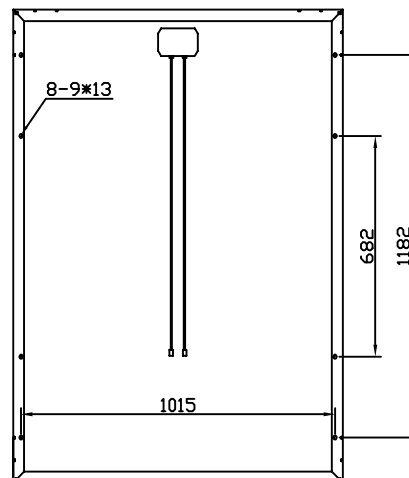
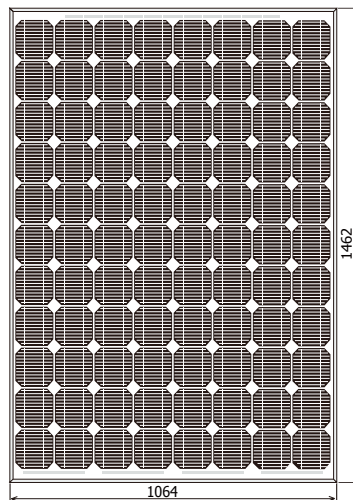
Temperature Coefficients

Power Coefficient	$\alpha_k (P_{MPP})$	-0.45 %/K
Voltage Coefficient	$\beta_k (U_{OC})$	-0.35 %/K
Current Coefficient	$\varphi_k (I_{SC})$	0.065 +/-0.015 %/K

Power Warranty

10 years performance warranty to 90 %
25 years performance warranty to 80 %
5 years warranty against production and material defects

Engineering Drawing



Certifications:
IEC 61215, IEC 61730, TUV, CE, ISO9001:2000



Solar Module JPO-240M/250M

Technical Data

Type	JPO240M, JPO2500M
Type of Solar Cell	Mono-crystalline, 125 mm x 125 mm
Number of Cells	96 pcs
Size of Module	1580 x 1064 x 30 mm (125 x 125 mm cell)
Module, Weight	20 kg
Connector/Cross-Section	Cixi Renhe
Cables, Length (+/-)	900 mm
Front Cover Glass	Safety Glass
Font Cover Glass, Thickness	3.2 mm
Frame	Anodized Aluminium

Electrical Data

Maximum Power	$P_{MPP,STC}$	240 W	250 W
Power Tolerance	Δ_{STC}	+/- 2%	+/-2%
Maximum Power Voltage	$U_{MPP,STC}$	48.0 V	48.0 V
Maximum power Current	$I_{MPP,STC}$	5.00 A	5.21 A
Open Circuit Voltage	$U_{OC,STC}$	59.8 V	59.8 V
Short Circuit Current	$I_{SC,STC}$	5.28 A	5.50 A
Cell Efficiency	η_{STC}	16.83 %	17.53 %
Maximum System Voltage	U_{DC}	1000 V	1000 V

STC: Irradiance 1000 W/m²; Spectrum AM 1,5; Cell Temperature 25°C, Wind 0 m/s

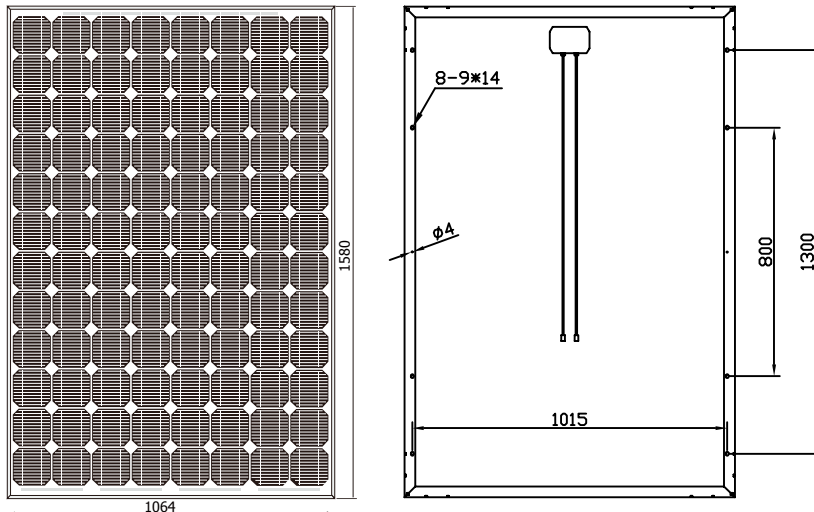
Temperature Coefficients

Power Coefficient	$\alpha_k (P_{MPP})$	-0.45 %/K
Voltage Coefficient	$\beta_k (U_{OC})$	-0.35 %/K
Voltage Coefficient	$\varphi_k (I_{SC})$	0.065 +/-0.015 %/K

Power Warranty

10 years performance warranty to 90 %
25 years performance warranty to 80 %
5 years warranty against production and material defects

Engineering Drawing



Certifications:
IEC 61215, IEC 61730, TUV, CE, ISO9001:2000



Solar Module JPO-290M/300M

Technical Data

Type	JPO290M, JPO300M
Type of Solar Cell	Mono-crystalline, 156 mm x 156 mm
Number of Cells	72 pcs
Size of Module	1956 x 992 x 50mm (156 x 156 mm cell)
Module, Weight	26 kg
Connector/Cross-Section	Cixi Renhe
Cables, Length (+/-)	900 mm
Front Cover Glass	Safety Glass
Font Cover Glass, Thickness	3.2 mm
Frame	Anodized Aluminium

Electrical Data

Maximum Power	$P_{MPP,STC}$	290 W	300 W
Power Tolerance	Δ_{STC}	+/- 2%	+/- 2%
Maximum Power Voltage	$U_{MPP,STC}$	36.0 V	36.0 V
Maximum power Current	$I_{MPP,STC}$	8.06 A	8.33 A
Open Circuit Voltage	$U_{OC,STC}$	44.8 V	44.8 V
Short Circuit Current	$I_{SC,STC}$	8.52 A	8.81 A
Cell Efficiency	η_{STC}	16.87 %	17.41 %
Maximum System Voltage	U_{DC}	1000 V	1000 V

STC: Irradiance 1000 W/m²; Spectrum AM 1,5; Cell Temperature 25°C, Wind 0 m/s

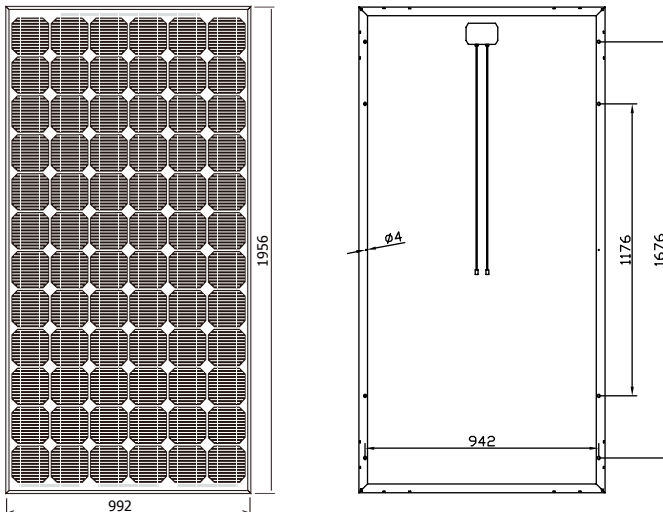
Temperature Coefficients

Power Coefficient	$\alpha_k (P_{MPP})$	-0.45 %/K
Voltage Coefficient	$\beta_k (U_{OC})$	-0.35 %/K
Current Coefficient	$\varphi_k (I_{SC})$	0.065 +/-0.015 %/K

Power Warranty

10 years performance warranty to 90 %
25 years performance warranty to 80 %
5 years warranty against production and material defects

Engineering Drawing



Certifications:
IEC 61215, IEC 61730, TUV, CE, ISO9001:2000



Solar Module JPO-205P/210P

Technical Data

Type	JPO205P, JPO210P
Type of Solar Cell	Poly-crystalline, 156 mm x 156 mm
Number of Cells	54 pcs
Size of Module	1474 x 992 x 40 mm (156 x 156 mm cell)
Module, Weight	16 kg
Connector/Cross-Section	PV Junction Box
Cables, Length (+/-)	900 mm
Front Cover Glass	Safety Glass
Font Cover Glass, Thickness	3.2 mm
Frame	Anodized Aluminium

Electrical Data

Maximum Power	$P_{MPP,STC}$	205 W	210 W
Power Tolerance	Δ_{STC}	+/- 2%	+/-2%
Maximum Power Voltage	$U_{MPP,STC}$	27.8 V	28.8 V
Maximum power Current	$I_{MPP,STC}$	7.37 A	7.29 A
Open Circuit Voltage	$U_{OC,STC}$	34.0 V	35.6 V
Short Circuit Current	$I_{SC,STC}$	7.78 A	7.87 A
Cell Efficiency	η_{STC}	15.6 %	15.9 %
Maximum System Voltage	U_{DC}	1000 V	1000 V

STC: Irradiance 1000 W/m²; Spectrum AM 1,5; Cell Temperature 25°C, Wind 0 m/s

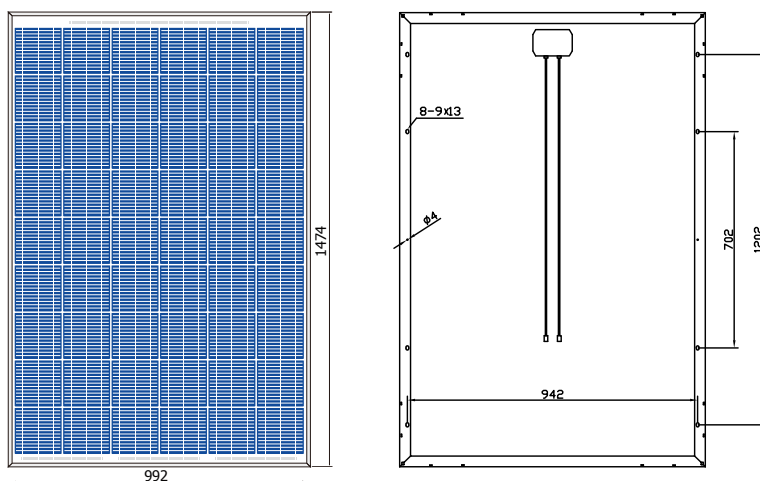
Temperature Coefficients

Power Coefficient	$\alpha_k (P_{MPP})$	-0.45 %/K
Voltage Coefficient	$\beta_k (U_{OC})$	-0.35 %/K
Voltage Coefficient	$\varphi_k (I_{SC})$	0.065 +/-0.015 %/K

Power Warranty

10 years performance warranty to 90 %
25 years performance warranty to 80 %
5 years warranty against production and material defects

Engineering Drawing



Certifications:
IEC 61215, IEC 61730, TUV, CE, ISO9001:2000



Solar Module

JPO-215P/220P/225P/230P/235P

Technical Data

Type	JPO215P, JPO220P, JPO 225P, JPO230P, JPO235P
Type of Solar Cell	Poly-crystalline, 156 mm x 156 mm
Number of Cells	72 pcs
Size of Module	1652 x 992 x 50mm (156 x 156 mm cell)
Module, Weight	18.8 kg
Connector/Cross-Section	Junction Box, IP65
Cables, Length (+/-)	900 mm
Front Cover Glass	Safety Glass
Font Cover Glass, Thickness	3.2 mm
Frame	Clear anodized aluminum, AL6063-T5

Electrical Data

Maximum Power	$P_{MPP,STC}$	215 W	220 W	225W	230W	235W
Power Tolerance	Δ_{STC}	+/- 3%	+/- 3%	+/- 3%	+/- 3%	+/- 3%
Maximum Power Voltage	$U_{MPP,STC}$	29.28 V	28.84 V	29.05 V	29.22 V	29.72 V
Maximum power Current	$I_{MPP,STC}$	7.36 A	7.64 A	7.77 A	7.84 A	7.93 A
Open Circuit Voltage	$U_{OC,STC}$	36.96 V	37.08 V	37.26 V	37.42 V	37.80 V
Short Circuit Current	$I_{SC,STC}$	8.34 A	8.38 A	8.47 A	8.51 A	8.59 A
Cell Efficiency	η_{STC}	13.12 %	13.42 %	13.73 %	14.03 %	14.34 %
Maximum System Voltage	U_{DC}	1000 V	1000 V	1000 V	1000 V	1000 V

STC: Irradiance 1000 W/m²; Spectrum AM 1,5; Cell Temperature 25°C, Wind 0 m/s

Temperature Coefficients

Power Coefficient	$\alpha_k (P_{MPP})$	-0.0254 %/K
Voltage Coefficient	$\beta_k (U_{OC})$	-0.3003 %/K
Current Coefficient	$\varphi_k (I_{SC})$	-0.4147 %/K

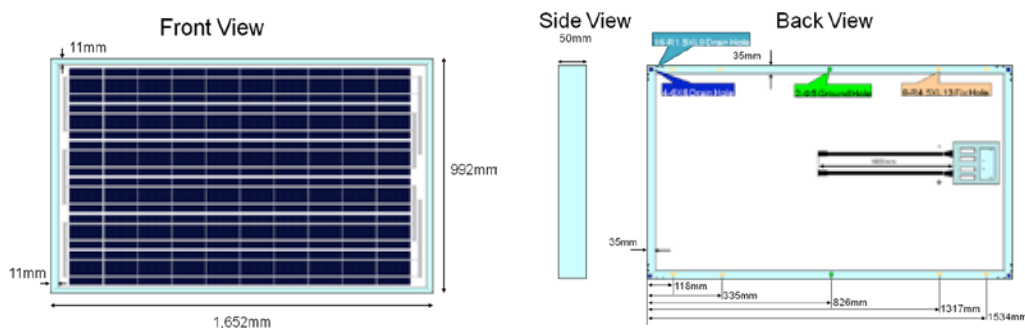
Power Warranty

10 years performance warranty to 90 %

25 years performance warranty to 80 %

5 years warranty against production and material defects

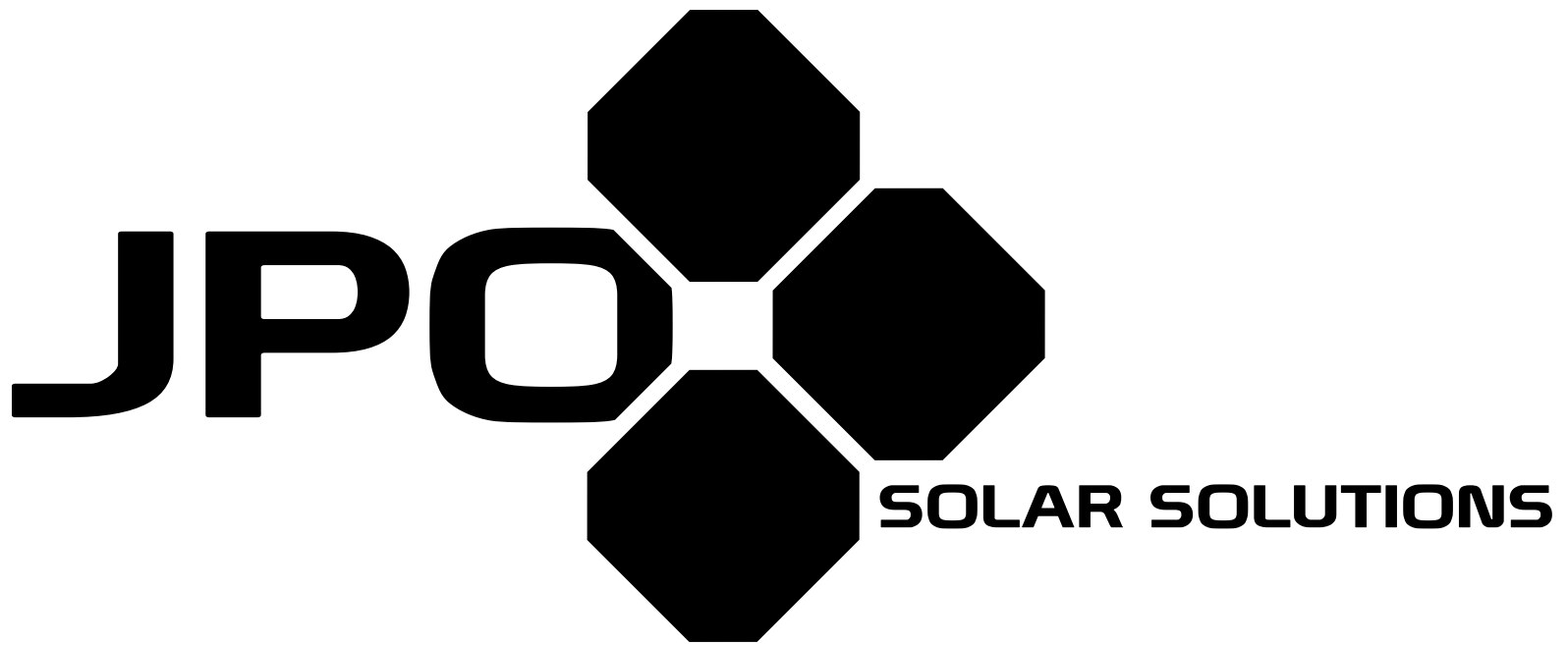
Engineering Drawing




Certifications: IEC 61215, IEC 61730, TUV, CE, ISO 9001:2000, ISO 14001, UL1703/ULC1703









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