汉伏能源
CSUNPOWER™

CSUNPOWER Photovoltaic Solutions

Global / high-tech / your safe choice

Grid

CSUNPOWER is a joint venture company formed by a union of prominent Chinese photovoltaic manufacturing entrepreneurs. The company focuses on global clean energy development, solutions, investment and financing, energy management and electricity distribution business. CSUNPOWER utilizes the strength in PV manufacturing, supply chain, and technology to form a highly reputable international energy solutions provider.

CSUNPOWER has set up branches in United States, Japan, Philippines, Pakistan, Thailand, and the area of Middle East, forms a professional team to provide services to the local market, and realize the entrepreneurial strategy of "Globalized Partners, Local Professional Services". We devote ourselves to providing the best quality and efficient one-stop service for our global customers.

CSUNPOWER has a professional management team, adhering to the business philosophy of "efficient, professional, practical, and low-cost". We have many years of experience in the area of project development, design, engineering, research and development, project management, investment and financing, supply chain management, control, and project implementation & delivery, which we have received many compliments from our business partners.

1. Overview of the Power Plant System

On grid solar system is a renewable energy system, which can transfer solar energy into electricity and inject it to power grid. The energy generated from solar system will offset the energy customer used from power grid, so as to help reduce cost of monthly electricity bill, and enjoy life with clean energy.

	CSUNPOWER G1K S	CSUNPOWER G1.5K S	CSUNPOWER G2K S	CSUNPOWER G3K S	CSUNPOWER G5K S	CSUNPOWER G10K S
System Peak Power DC (W)	1000	1500	2000	3000	5000	10000
Daily Energy Production (approx*)(kWh)	4.4	6.6	8.8	13.2	22.1	44.2
Number of 270W Poly Solar Panels(Optional)	4	6	8	12	20	40
Roof Area Required (mtrs sq.)	7	10	14	20	33	66
Number of independent MPP trackers /strings per MPP tracker	1/1	1/1	1/2	1/2	1/3	1/3
AC Output Max.	1000VA	1500VA	2000VA	3000VA	5000VA	10000VA

Main Components

PV Module	CSUN 270○60P	4	6	8	12	20	40
Grid Inverter	1000TL	1					
	1500TL		1				
	2000TL			1			
	3000TL				1		
	5000TL					1	2
Bracket	Set	1	1	1	1	1	1
PV Cable	m	50	50	60	70	100	160
Connector	Set	2	2	4	4	6	6
Others							

AC Output

AC nominal voltage; range	220,230,240V; 180Vac○280Vac					
AC grid frequency; range	50,60H;±5 Hz					
Power factor	1					
THDI	<3%					
AC connection	Single phase					
Max. efficiency(Inverter)	97%	97%	97%	97.80%	97.80%	97.80%

Package

Module Weight(Kg)	76.4	114.6	152.8	229.2	382	744.9
Module Dimensions (L*W*H)	1640*990*40mm					
Container 20 FT	21			14		
Container 20 FT HC	28			21		
Container 40 FT	45			45		
Container 40 FT HC	60					

Notes：

1, Installation materials needed for the solar systems depend on where & how will the equipments be mounted. Some extended materials will be prepared by the customers if needed.

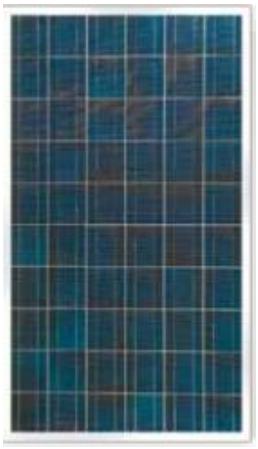
2, Final Packing plan may change with different structure requirement, Provides data for reference only.

3, The Average Daily Energy production is based on specific prod 4.1kWh/kWp/ day.

2. Main equipment

2.1 Photovoltaic Modules

Our standard modules are designed, developed and manufactured for both residential and commercial, rooftop and ground-mounted, as well as on-grid and off-grid photovoltaic projects. Quality of our products is the reason of CSUN's life. We select the best raw materials and conduct regular testing to ensure that they can meet our rigorous quality standards. Every module has been tested before delivery to make sure the efficiency tolerance is in a narrow range. Each link is strictly controlled to ensure the benefit of our customers.

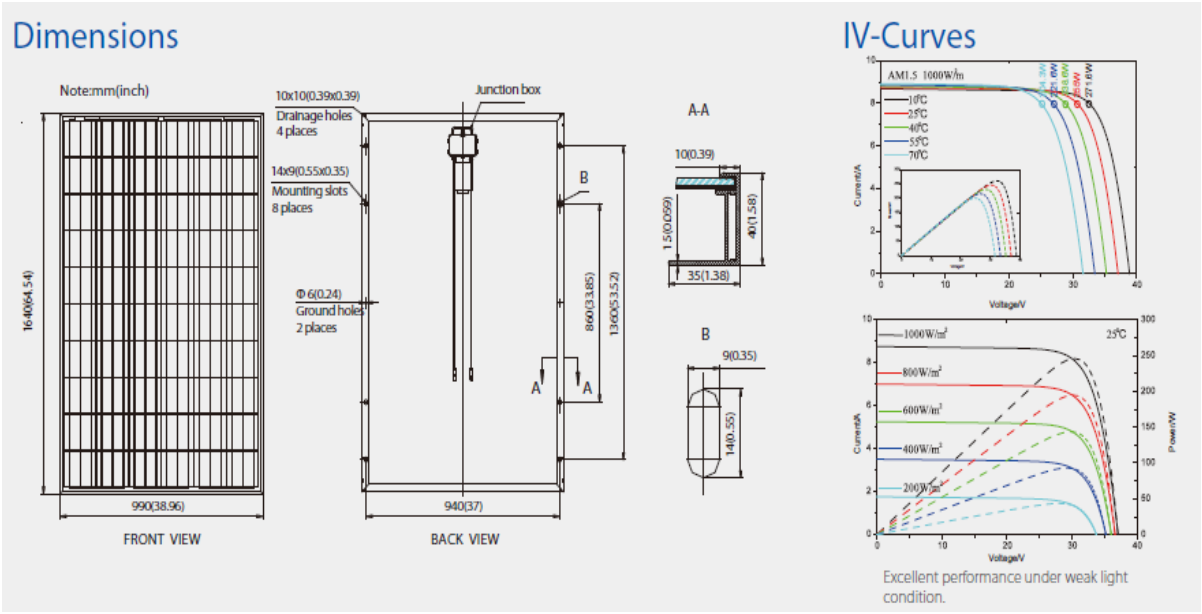


Features

- 60 High-Efficiency Polycrystalline Solar Cells;
- Passing mechanical load test of 5400Pa according to IEC 61215(advanced test);
- Tested to withstand hails with maximum diameter of 25mm with impact speed of 23m/s;
- The high-transparency low-iron tempered glass allows maximum light permeability while enhancing stiffness
- and impact resistance;
- Integrated bypass diodes to protect the solar cell circuit from hot spots during partial shadowing;
- Our module technology avoids any problems of water freezing and warping;
- Black back sheet or black frame is also available.

Electrical characteristics at Standard Test Conditions(STC)		Temperature Characteristics	
Module type	CSUN 270-60P	Voltage Temperature Coefficient	-0.292%/K
Pmpp[W]	270	Current Temperature Coefficient	+0.045%/K
VocM	37.9	Power Temperature Coefficient	-0.408%/K
Isc [A]	9.08	Mechanical Characteristics	
VmppM	30.7	Dimension With Weight Frame	1640x990x40mm(LxWxH)
Impp[A]	8.8	Weight	19.1kg
Module efficiency	16.63%	Cell	6xl0 pieces polycystic line solar cells series strings *(156mmxl56mm)*
Junction Box	with 6bypass diode	Back Sheet	White roughened safety glass，*3.2mm*

Standard Test Conditions(STQ irradiance 1000W/㎡ AM 15;cell temperature 25℃. Measuring uncertainty of power is within: 1:3%.



2.2 String Inverter

The string inverters for feeding grid-connected photovoltaic systems are the one of the best choice for medium-sized systems. Outstanding peak efficiency factors, patented technology and high-quality workmanship make them a reliable choice for permanently high system yields. This is ideally complemented by simple operation and comprehensive warranty and servicing options.

- Maximum efficiency of 97.8% and wide input voltage range
- Internal DC switch
- Transformer less GT topology
- Compact design
- MTL – String

Specifications	1000TL	1500TL	2000TL	3000TL	4000TL	5000TL
Max. DC power	1300W	1800W	2300W	3200W	4200W	5000W/5200W*
Max. DC voltage	450V	450V	500V	500V	580V	580V
Start voltage	90V	150V	150V	150V	150V	150V
PV voltage range	70V-450V	100V-450V	100V-500V	100V-500V	100V-580V	100V-580V
MPP work voltage range/ nominal voltage	70V-450V/180V	120V-450V/360V	120V-500V/360V	120V-500V/360V	120V-580V/360V	120V-580V/360V
Full load dc voltage range	110V-400V	175V-450V	195V-450V	260V-450V	260V-500V	260V-500V
Max. input current	10A	10A	12A	15A	20A	20A
Max. input current per string	10A	10A	12A	15A	20A	20A
Rated AC output power	1000W	1600W	2000W	2850W	3680W	4600W
Max. AC power	1100W	1650W	2200W	3000W	4000W	4600/5000W*
Max. output current	5.5A	8A	11A	15A	16A	22.7A
AC nominal voltage; range	220,230,240V; 180Vac-280Vac					
AC grid frequency; range	50,60H;±5 Hz					
Power factor	1					
THDI	<3%					
AC connection	Single phase					
Max. efficiency	97%	97%	97%	97%	97.80%	97.80%
Euro weighted efficiency	95.50%	96.50%	96.50%	96.50%	97.40%	97.40%
MPPT efficiency	99.50%	99.50%	99.50%	99.50%	99.50%	99.50%
Protection devices	DC reverse polarity protection DC switch rating for each MPPT Output over current protection		Output over voltage protection-varistor Ground fault monitoring		Grid monitoring Integrated all - pole sensitive leakage current monitoring unit	
Dimensions (W / H / D) in mm	360/329/132				406/406/192	
Weight	10.5KG	11.5KG	11.7KG	12.2KG	21KG	21KG
Operating temperature range	–25°C ... +60°C (-13...+140℉) with derating above 50°C /122℉					
Noise emission (typical)	≤ 25 dB(A)					
Altitude	2000m(6560ft) without derating				2000m(6560ft) without derating	
Self-Consumption night	< 0.5 W					
Topology	transformer less					
Cooling concept	Natural					
Environmental Protection Rating	IP65					
Relative humidity	0.95					
DC connection	H4/MC4(opt)					
AC connection	Screw terminal					
Display	LCD					
Interfaces: RS485/RS232/Bluetooth / RF/Zigbee/Wifi	yes/opt					

2.3 CSUNPOWER Mounting Structure

One of the most important features of mounting system is the duration under different weather conditions. Structure must be solid and reliable，able to withstand atmospheric erosion，wind loads and other external effects，safe and reliable installation，with minimal installation achieve the maximum effect of the use，almost maintenance-free surface，and reliable maintenance，these are to do a program selection the important factor to consider. System-based solution makes the installation of that devices become commercially possible，in order to achieve the best result..

- Designed for crystalline module installation.
- Anti-leakage design.
- Water chute on the aluminum rail.
- EPDM sealing rubber between modules, etc.
- Easy Installation.
- Aesthetical appeal.

· Widely used for both crystalline and thin film modules.

· Easy & quick installation.

· Only 4~5 kinds of components and no more than three kinds of tools in whole system fixation.

· All system components are made with high quality aluminum & stainless steel.

· Adoptable to all kinds of crystalline modules and certain thin film modules.

· Direct foundation bolt, concrete base or bear load are the possible solution for ground installation.

· System installation inclination is adjustable according to requirement.

· Easy installation, only three kinds of tools could finish the installation.

2.4 PV Cables and Connectorss

We have designed 4mm2 solar cables to minimize losses in efficiency and ensure optimal operation even at high temperatures. All cables from PV modules to inverter have been designed to minimize losses and ensure optimal operation even at high temperatures. These cables are extremely robust and resist high mechanical load and abrasion. High temperature resistance and excellent weather proofing characteristics provide a long service life.

- Multiple plugging and unplugging cycles.
- Highly robustness, UV-Resistance.
- Connector adopts insertion of reed with inner-knob type.
- Auto-lock equipment for male and female points enables connection easier and reliable.
- Popular appearance suit most of field installation.
- Simple on-site operation.
- Fit for PV cables with different insulation diameters.
- High current carrying capacity

PV Cable Technical data	
Nominal Voltage	UO/U-600/1000AC.1800DC
Test Voltage	6500V5min 50HZ
Conductor DC Resistance	at 20°C≤0.795Ω/Km
Temp. rating	-40°C ~ +125°C
Max.Conductor Temp	+120°C
Ambient Temp	.(-40°C ~ +90°C): > 25years
Bending radius	≥ 8* cable OD
Fire performance	IEC60332-1 TUV 3PFG 1169/08: 2007
UV Resistant	≥ 720h
Content of halogen acid gas	IEC670754-1 EN50267-2-1
Smoke density	IEC61034 EN50268-2

MC4 Connectors Technical data	
Insulation material	PPO
Color	Black
Contact material	Copper tin plated
Rate voltage	DC 1500V(TUV)600V(UL)
Rated current	30A
Safety class	class 2
Waterproof grade	IP 68
Temperature range	-40 ~+90 Celsius degree
Flame retardant grade	UL94-V0
Pin dimensions	Φ4mm
Test voltage	6kv(TUV50HZ 1min)
Contact resistance	0.4 mΩ

2.5 Monitoring System

CSUNPOWER Monitoring system includes the LCD monitor, Its large display shows the current power, total energy production, current, voltage, current status and historical information, operating information, if necessary, can set parameters by LCD.

We can also provide our customers with a flexible internet monitoring solution which is suitable for residential, commercial rooftop systems and PV power plants. System monitoring device is user-friendly and reliable. It can archive all-weather data and automatically transmit data to our global PV monitoring web-server via internet. Our customers can login monitoring website or use smart phone Apps to check power plant information.

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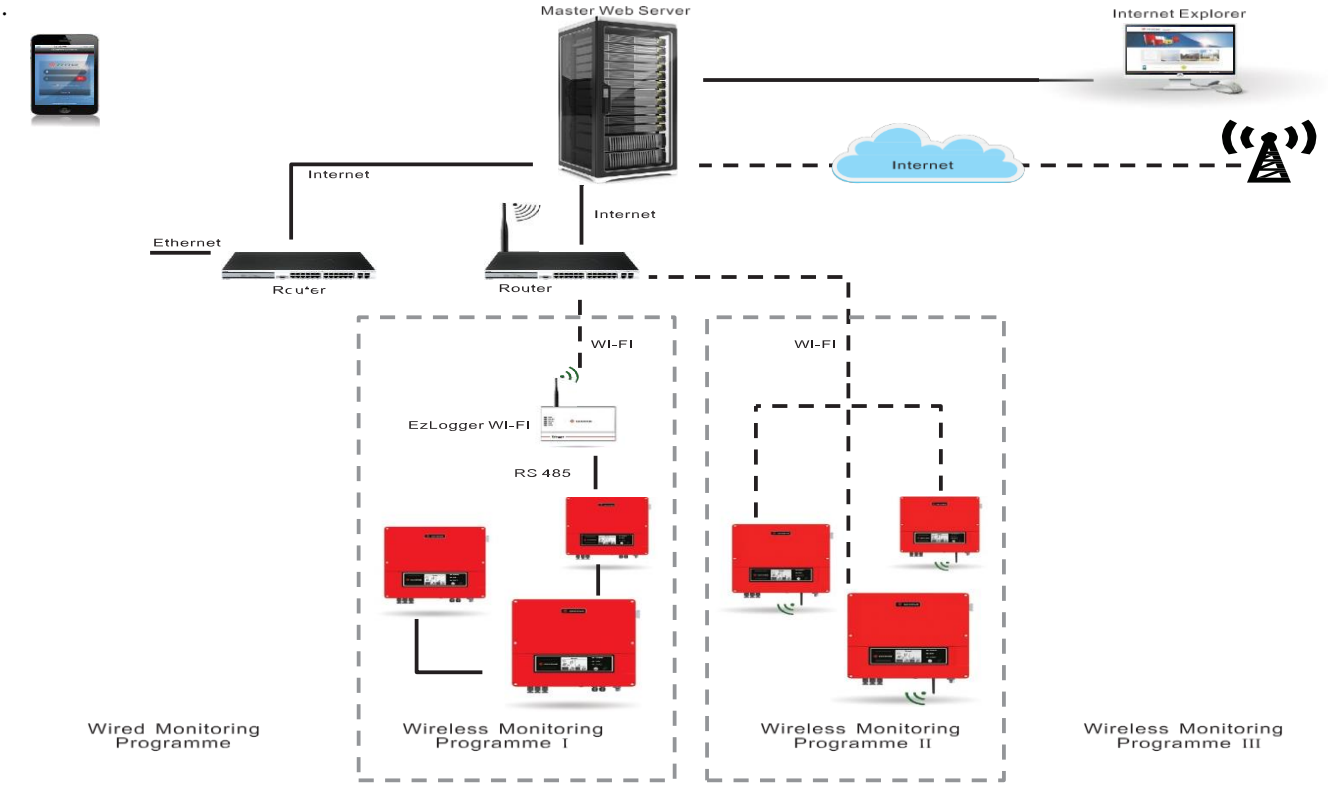

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