Solar energy installation shared

PROJECT: CDAD PROP.URB.CALANOVA SEA GOLF

SOLAR ENERGY OFFER

Date: 28 october 2020

Content

KNOW US

About us

We are a dedicated company exclusively to photovoltaic solar energy.

We are accredited by the Andalusian Energy Agency, as a collaborating company..

Accreditation involves meeting a very strict set of requirements..

- ✓ Personnel with university degrees
- ✓ Officially qualified technical staff
- ✓ Electrical installation company
- ✓ Training as solar energy installers
- ✓ Energy Consulting
- ✓ Measuring equipment

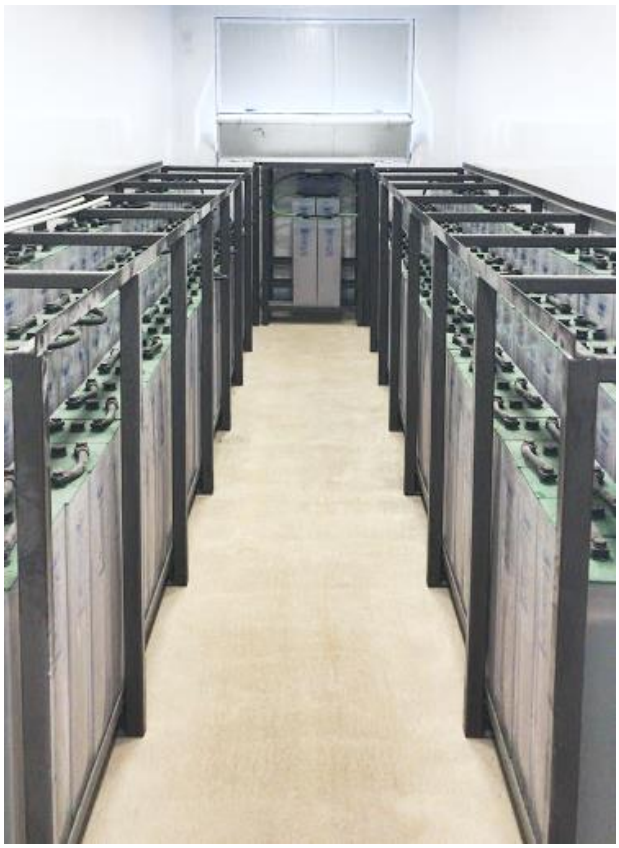
What training do we have?

- Technical direction with engineers graduated in Industrial electrical branch and Telecommunication electronic equipment.
- Drafting of projects and endorsements by the competent professional associations. Drafting of
- energy advisory documents.
- Issuance of energy efficiency certificates.
- Issuance of prior and subsequent certificates to access grants.

What is our demonstrable experience?

To these examples we can add::

- Dozens of livestock farms
- Residential self-consumption facilities
- SMEs from various sectors
- Small solar parks for energy sales



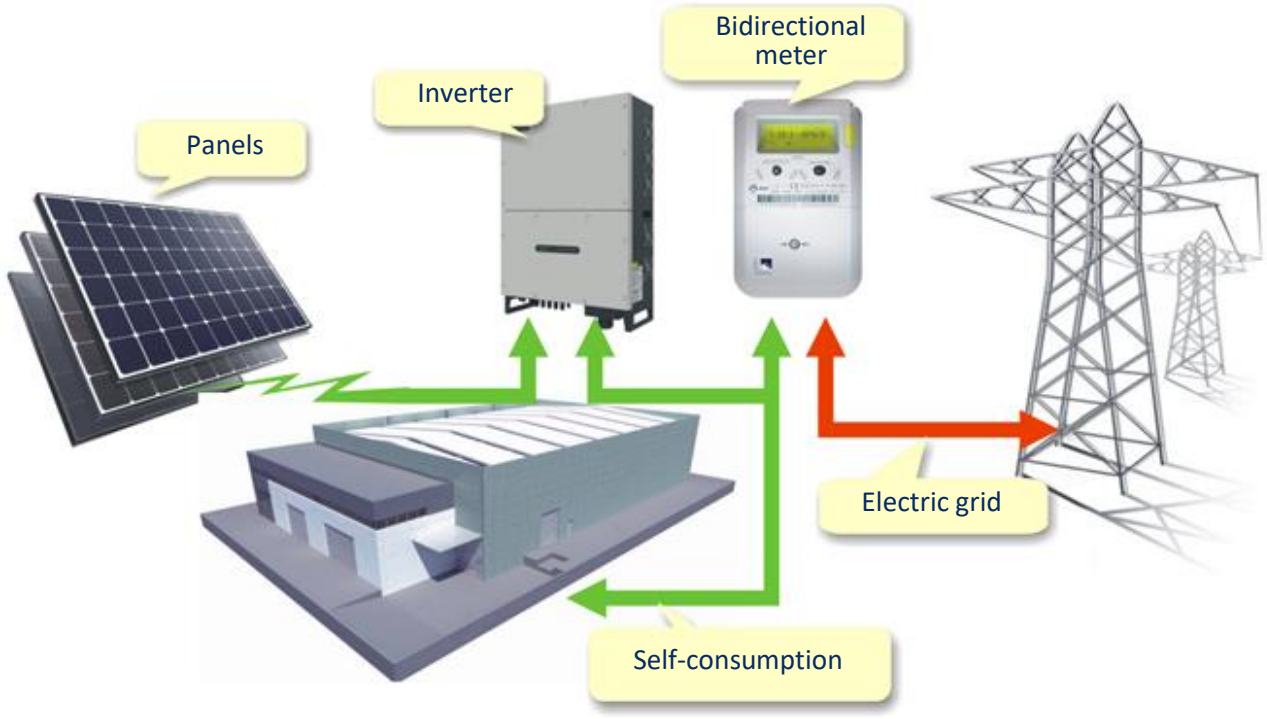
How does self-consumption work?

It is already legal in Spain for each company to have its own electric power generation facility.

In addition, the Law allows the sale of surplus energy, in such a way that with this income from sale, the energy that will need to be purchased at night or during cloudy days can be offset.

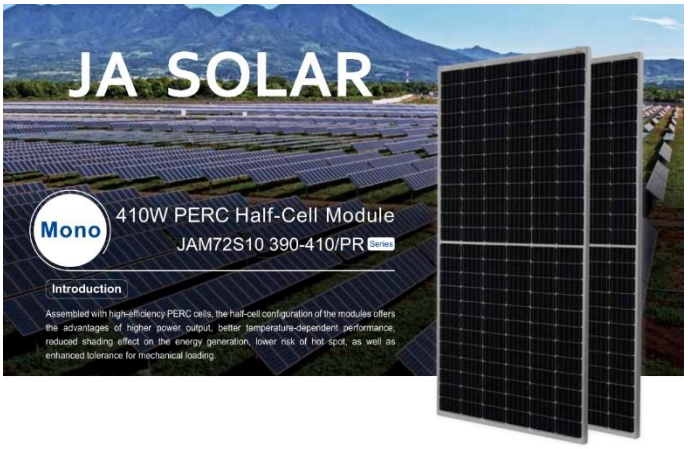
In our electricity bill there will be a balance of the energy consumed and the energy sold..

Self-consumption installation connected to network



In this installation, the energy generated is used to supply existing consumption. When there is a surplus, it is injected into the network and sold.

Proposed reference equipment:

Example photo	***Description***
	Solar panel TIER 1 listed Brand : Seraphim Power: 390 – 405W Series: S2 Monocrystalline Product warranty: 15 years Energy prod. Warranty : 25 years
	Solar panel TIER 1 listed Brand : JA SOLAR Power: 390 – 410W Series: 72S Monocrystalline Product warranty: 12 years Energy prod. Warranty : 25 years
	Manufacturer: HUWAEI Inverters from 33kw to 105Kw Designed for solar gardens, with a high voltage output of 1,000V, to group them and add power, they are modular, direct inputs from solar panels. Wide range of available powers. They communicate with a central using their own network cables. Self-diagnosis, remotely controlled.

Study:

OFFER INSTALLATION OF COMMUNITY SOLAR ENERGY 100 OWNERS

Proposal:	**Self-consumption with surplus compensation, with 300,000 peak watts**
Customer:	**Owners CDAD PROP.URB.CALANOVA SEA GOLF**
Address	**UR CALANOVA SEA GOLF. 0, BLOQUE 6,P.1, ALB EXTERIOR**
Phone	**0**
Mail:	_
CIF:	**0**
Province	**MALAGA**
City	**MIJAS COSTA**

Done by: **Pablo A. Tavitian**

Phone: **665 228 163**

Parameters used in calculations

We estimate the necessary power per home to be around 3Kw, extending the calculation to a participation of 100 owners, the resulting total power would be 300,000 W peak.

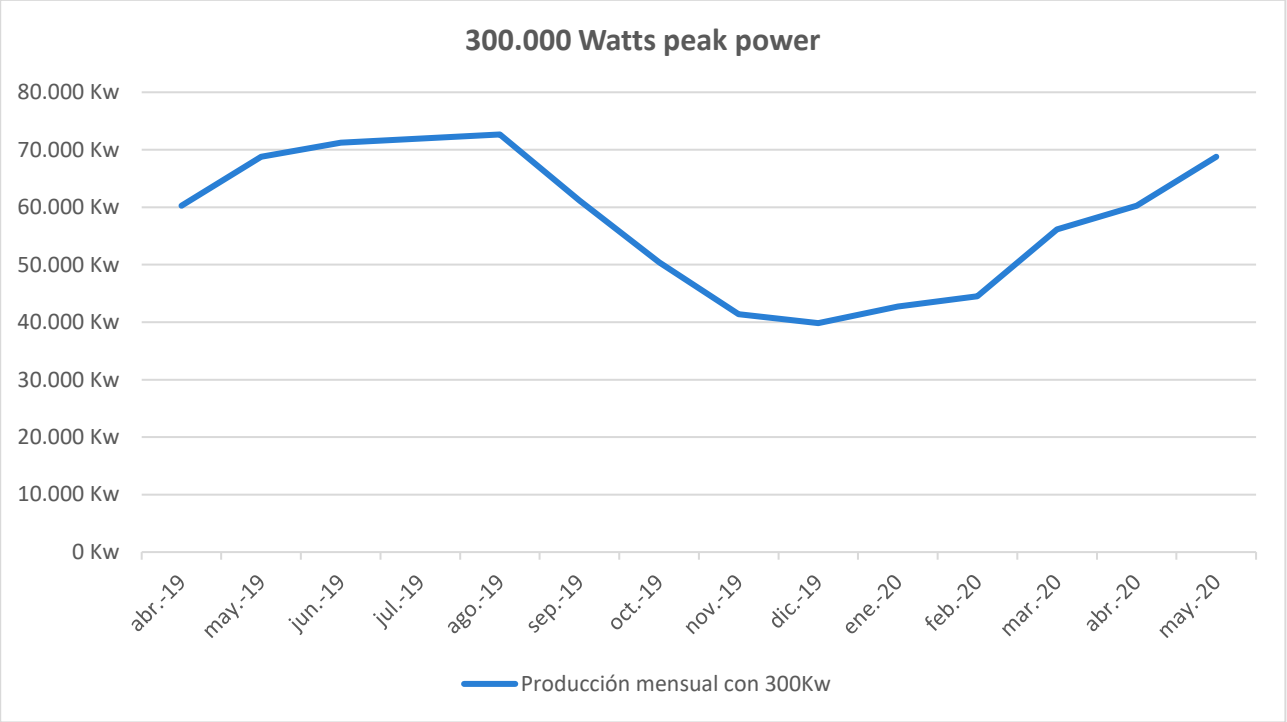
For which 750 panels of 400W each are needed.

The surface per panel is 2m2, a total of 1,500m2 of free surface is needed

As it appears in Google maps, there are a large number of green areas, any of them could accommodate the installation of the panels. The indicated location is for informational purposes only, and the panels could go anywhere else in the complex.

The system is expandable to cover all the neighbors that make up the residential complex.

Estimated production of the plant



Estimation of the environmental impact

CO2 saved per year: 486.156 Kg

Trees planted every year: 13.065

Budget:

Self-consumption with surplus compensation, with 300,000 peak watts

MATERIALS AND LABOR	Unid	Mat	TOTAL
FIJ5 Structure for ground mounting	750,0	65,28 €	48.960,00 €
PB Monocrystalline Solar Panel 400W	750,0	204,00 €	153.000,00 €
Installed peak power = 300.000 W			
INVE Inverter Huawei 105Kw, V-600-1500v output 800V	3,0	10.430,32 €	31.290,96 €
Possible peak power = 300.000 W			
K1 Huawei remote control system	3,0	1.356,60 €	4.069,80 €
Conduits, cables and gutters	1,0	12.530,70 €	12.530,70 €
Electrical panel and electrical safety elements	1,0	8.320,00 €	8.320,00 €
Miscellaneous (fuse box, diodes, meters)	1,0	3.084,00 €	3.084,00 €
Labor and commissioning	1,0	53.182,34 €	53.182,34 €
Total budget including installation (without VAT)			**314.437,80 €**
TOTAL PRICE TO PAY WITH VAT 21%			**380.469,73 €**

ENERGY GENERATION SOLAR PLANT

Ubicación de la instalación : MIJAS COSTA provincia : MALAGA

Annual energy consumption	**Unknown**
Annual energy production	**687.633 Kwh/year**
Annual hours of sunshine	**2.092**

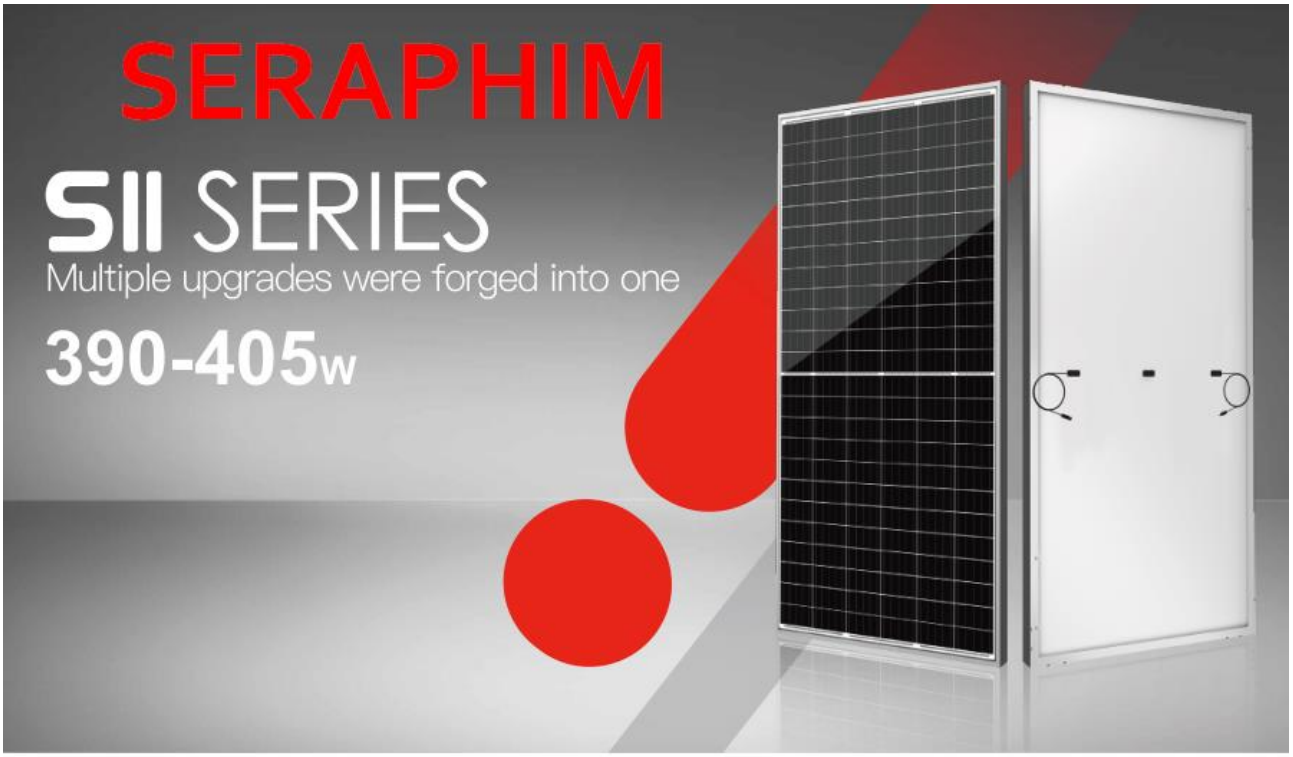
FINANCING PROPOSAL

Inversión	**380.470 €**	**Con IVA**
Interés anual	**3,00%**	**(Orientativo)**
Plazo amortización	**10 años**	
Mensualidades	**12 meses**	
Cuota mensual	**3.674,00 €**	
Cuota a pagar por cada propietario	**36,74 €**	**(100 propietarios)**

Credit line from Deutsche Bank, specific for green investment in communities

Deutsche Bank

List of materials



• SII SERIES

Seraphim redefined the high-efficiency module series by integrating 158.75mm silicon wafers with PERC and half-cut cell technologies. Seraphim panel combined creative technology effectively and extremely improved the module efficiency and power out.

• KEY FEATURES

- Less mismatch to get more power
- Less power loss by minimizing the shading impact
- Competitive low light performance
- 3 times EL test to ensure best quality
- Ideal choice for utility and commercial scale projects by reduced BOS and improve ROI.
- Outstanding reliability proven by PVEL for stringent environment condition :
  - sand, acid, and alkali,hail stones,
  - 2400pa wind load and 5400pa snow load.
  - Anti-PID

• QUALITY SYSTEM

IS019001 / IS014001 / OHSAS18001

• PRODUCT CERTIFICATION

• INSURANCE

PICC

• WARRANTY

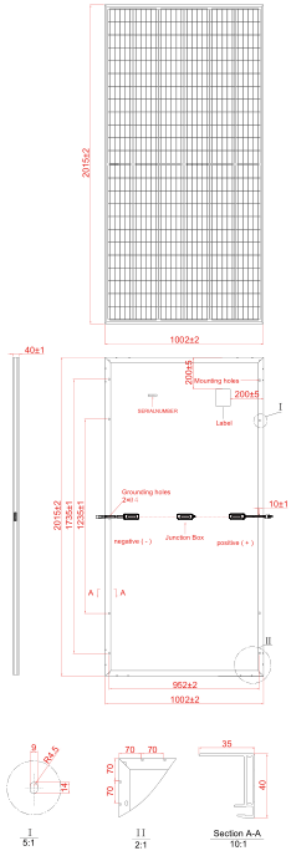
SERAPHIM®

SHIFTING · THE FUTURE
www.seraphim-energy.com

Electrical Characteristics

Module Type	SRP-390-BMA-HV	SRP-395-BMA-HV	SRP-400-BMA-HV	SRP-405-BMA-HV
	STC	STC	STC	STC
Maximum Power at STC (Pmp)	390	395	400	405
Open Circuit Voltage (Voc)	48.7	48.9	49.1	49.4
Short Circuit Current (Isc)	9.95	10.03	10.10	10.15
Maximum Power Voltage (Vmp)	41.2	41.4	41.6	41.9
Maximum Power Current (Imp)	9.47	9.55	9.62	9.67
Module Efficiency at STC(ηm)	19.32	19.56	19.81	20.06
Power Tolerance	(0,+4.99)			
Maximum System Voltage	1500 VDC			
Maximum Series Fuse Rating	20A			

STC: Irradiance 1000 W/m² module temperature 25°C AM=1.5;



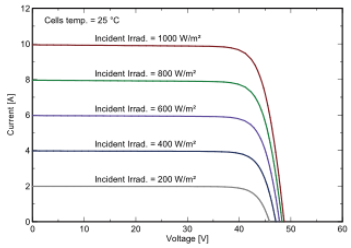
Temperature Characteristics

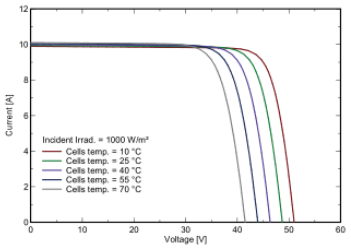
Pmax Temperature Coefficient	-0.36 %/°C
Voc Temperature Coefficient	-0.28 %/°C
Isc Temperature Coefficient	+0.05 %/°C
Operating Temperature	-40～+85 °C
Nominal Operating Cell Temperature (NOCT)	45±2 °C

Mechanical Specifications

External Dimensions	2015 x 1002 x 40 mm
Weight	23.0kg
Solar Cells	PERC Mono crystalline 158.75 × 79.375 mm(144pcs)
Front Glass	3.2 mm AR coating tempered glass, low iron
Frame	Anodized aluminium alloy
Junction Box	IP68, 3 diodes
Output Cable	4.0 mm², Portrait:255mm(+)/355mm(-);Landscape:1200mm
Mechanical Load	Front side 5400Pa/ Back side 2400Pa

I-V Curve

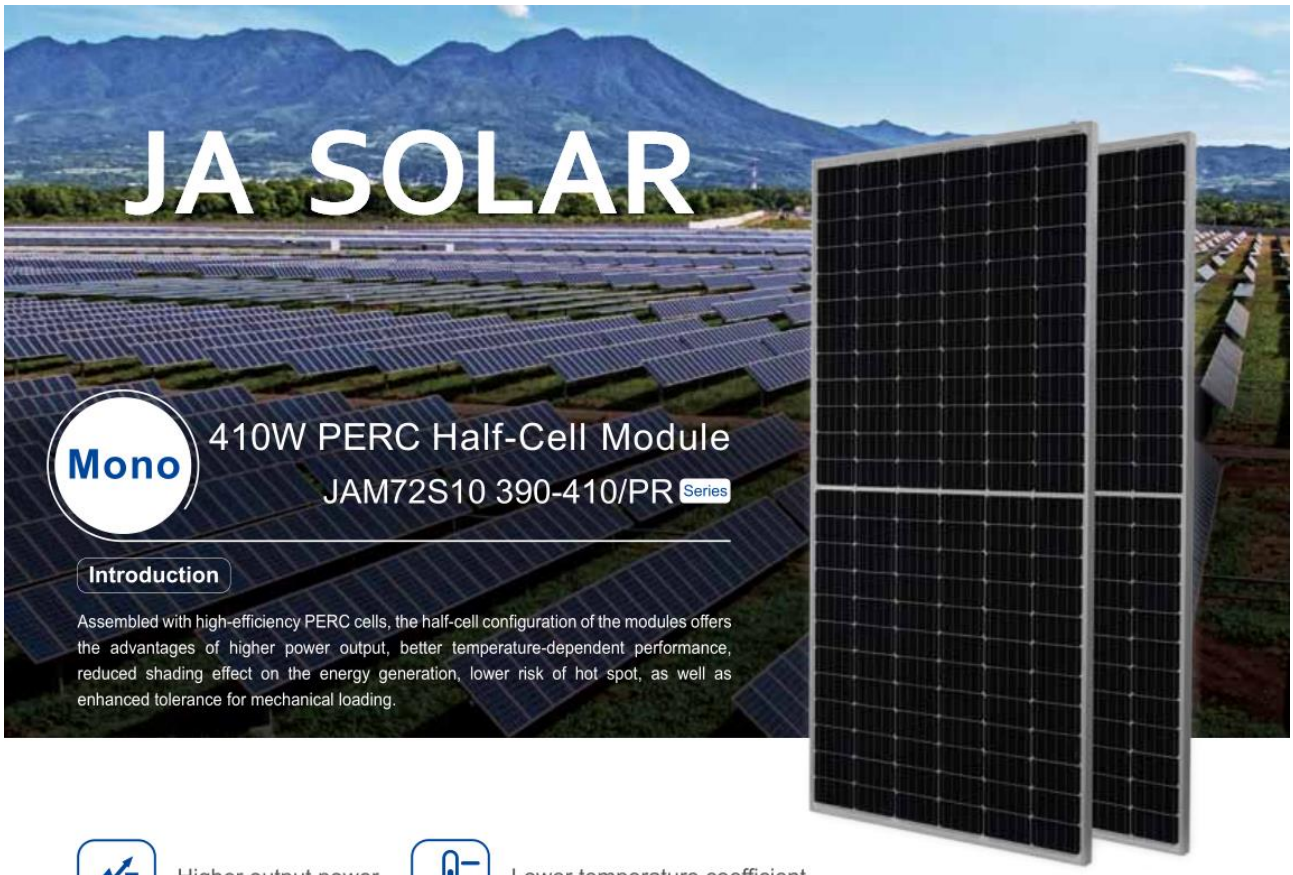




Packing Configuration

	2015 x 1002 x 40 mm	
Container	20'GP	40'HQ
Pieces per Pallet	27	27+2*
Pallets per Container	10	22
Pieces per Container	270	638

** 27+2 pieces per pallet is the special package which only suits for container transport. For details,please consult SERAPHIM.*



Higher output power

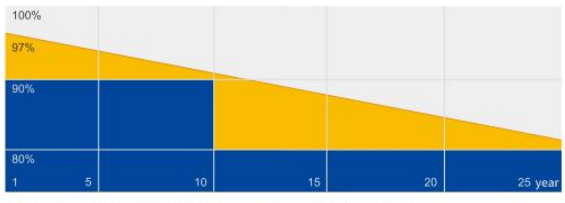
Lower temperature coefficient

Less shading effect

Better mechanical loading tolerance

Superior Warranty

- 12-year product warranty
- 25-year linear power output warranty



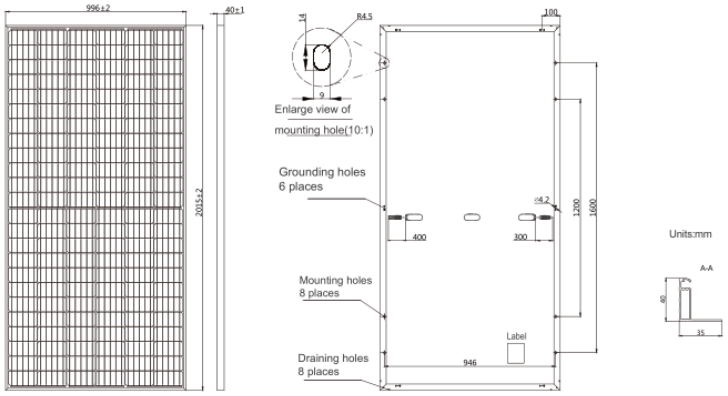
Comprehensive Certificates

- IEC 61215, IEC 61730, IEC TS 62804
- ISO 9001: 2015 Quality management systems
- ISO 14001: 2015 Environmental management systems
- OHSAS 18001: 2007 Occupational health and safety management systems
- IEC TS 62941: 2016 Terrestrial photovoltaic (PV) modules – Guidelines for increased confidence in PV module design qualification and type approval

JA SOLAR

JAM72S10 390-410/PR Series

MECHANICAL DIAGRAMS



Remark: customized frame color and cable length available upon request

SPECIFICATIONS

Cell	Mono
Weight	22.7kg±3%
Dimensions	2015±2mm×996±2mm×40±1mm
Cable Cross Section Size	4mm²
No. of cells	144（6×24）
Junction Box	IP68, 3 diodes
Connector	MC4 Compatible(1000V) QC 4.10-35(1500V)
Packaging Configuration	27 Per Pallet

ELECTRICAL PARAMETERS AT STC

TYPE	JAM72S10 -390/PR	JAM72S10 -395/PR	JAM72S10 -400/PR	JAM72S10 -405/PR	JAM72S10 -410/PR
Rated Maximum Power(Pmax) [W]	390	395	400	405	410
Open Circuit Voltage(Voc) [V]	48.91	49.21	49.50	49.81	50.12
Maximum Power Voltage(Vmp) [V]	40.55	40.85	41.17	41.46	41.76
Short Circuit Current(Isc) [A]	10.16	10.21	10.26	10.32	10.37
Maximum Power Current(Imp) [A]	9.62	9.67	9.72	9.77	9.82
Module Efficiency [%]	19.4	19.7	19.9	20.2	20.4
Power Tolerance	0~+5W				
Temperature Coefficient of Isc(α_Isc)	+0.051%/°C				
Temperature Coefficient of Voc(β_Voc)	-0.289%/°C				
Temperature Coefficient of Pmax(γ_Pmp)	-0.360%/°C				
STC	Irradiance 1000W/m², cell temperature 25°C, AM1.5G				

Remark: Electrical data in this catalog do not refer to a single module and they are not part of the offer.They only serve for comparison among different module types.

ELECTRICAL PARAMETERS AT NOCT

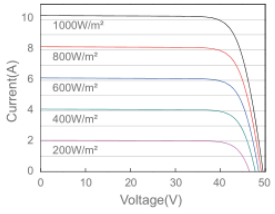
TYPE	JAM72S10 -390/PR	JAM72S10 -395/PR	JAM72S10 -400/PR	JAM72S10 -405/PR	JAM72S10 -410/PR
Rated Max Power(Pmax) [W]	289	292	296	300	303
Open Circuit Voltage(Voc) [V]	45.04	45.30	45.56	45.81	46.06
Max Power Voltage(Vmp) [V]	37.29	37.52	37.76	38.03	38.28
Short Circuit Current(Isc) [A]	8.18	8.23	8.28	8.33	8.38
Max Power Current(Imp) [A]	7.74	7.79	7.84	7.88	7.93
NOCT	Irradiance 800W/m², ambient temperature 20°C, wind speed 1m/s, AM1.5G				

OPERATING CONDITIONS

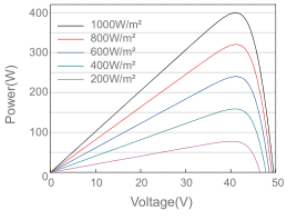
Maximum System Voltage	1000V/1500V DC(IEC)
Operating Temperature	-40°C~+85°C
Maximum Series Fuse	20A
Maximum Static Load,Front	5400Pa
Maximum Static Load,Back	2400Pa
NOCT	45±2°C
Application Class	Class A

CHARACTERISTICS

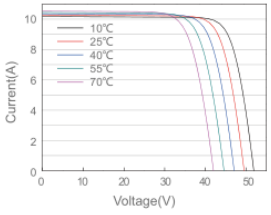
Current-Voltage Curve JAM72S10-400/PR



Power-Voltage Curve JAM72S10-400/PR



Current-Voltage Curve JAM72S10-400/PR



Premium Cells, Premium Modules Version No. : Global_EN_20181126A

Smart String Inverter

SUN2000 – 105KTL-H1

Smart

- 12 strings intelligent monitoring and fast trouble-shooting
- Power Line Communication (PLC) supported
- Smart I-V Curve Diagnosis supported

Safe

- DC switch integrated, safe and convenient for maintenance
- Residual Current Monitoring Unit (RCMU) integrated
- Fuse free design

Efficient

- Max. efficiency 99.0%
- European Efficiency 98.8%
- 6 MPPT per unit, effectively reducing string mismatch

Reliable

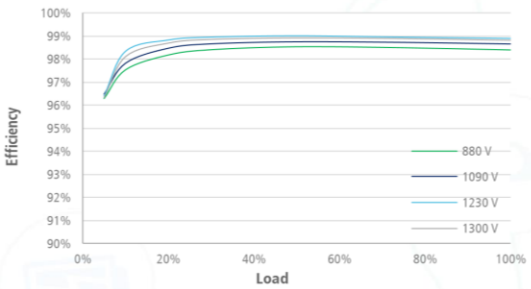
- Natural cooling technology
- Protection degree of IP65
- Type II surge arresters for both DC and AC

Smart String Inverter (SUN2000-105KTL-H1)

HUAWEI

Technical Specifications	SUN2000-105KTL-H1
	Efficiency
Max. Efficiency	99.0%
European Efficiency	98.8%
	Input
Max. Input Voltage	1,500 V
Max. Current per MPPT	25 A
Max. Short Circuit Current per MPPT	33 A
Start Voltage	650 V
MPPT Operating Voltage Range	600 V ~ 1,500 V
Rated Input Voltage	1,080 V
Number of Inputs	12
Number of MPP Trackers	6
	Output
Rated AC Active Power	105,000 W @40°C
Max. AC Apparent Power	116,000 VA @25°C
Max. AC Active Power (cosϕ=1)	116,000 W @25°C
Rated Output Voltage	800 V, 3W + PE
Rated AC Grid Frequency	50 Hz / 60 Hz
Rated Output Current	75.8 A
Max. Output Current	84.6 A
Adjustable Power Factor Range	0.8 LG ... 0.8 LD
Max. Total Harmonic Distortion	< 3%
	Protection
Input-side Disconnection Device	Yes
Anti-islanding Protection	Yes
AC Overcurrent Protection	Yes
DC Reverse-polarity Protection	Yes
PV-array String Fault Monitoring	Yes
DC Surge Arrester	Type II
AC Surge Arrester	Type II
DC Insulation Resistance Detection	Yes
Residual Current Monitoring Unit	Yes
	Communication
Display	LED Indicators, Bluetooth + APP
RS485	Yes
USB	Yes
Power Line Communication (PLC)	Yes
	General
Dimensions (W x H x D)	1,075 x 605 x 310 mm (42.3 x 23.8 x 12.2 inch)
Weight (with mounting plate)	79 kg (174.2 lb.)
Operating Temperature Range	-25°C ~ 60°C (-13°F ~ 140°F)
Cooling Method	Natural Convection
Max. Operating Altitude	4,000 m (13,123 ft.)
Relative Humidity	0 ~ 100%
DC Connector	Amphenol UTX
AC Connector	Waterproof PG Terminal + OT terminal
Protection Degree	IP65
Topology	Transformerless
	Standard Compliance *(more available upon request)*
Certificate	EN 62109-1/-2, IEC 62109-1/-2, IEC 62116, EN 50530, IEC 60068, IEC 61683
Grid Code	IEC 61727, ABNT NBR 16149, ABNT NBR 16150, ABNT NBR IEC 62116, VDE4120, RD 1699, RD 661, RD 413, RD 1565, UNE 206007-1 IN, UNE 206006 IN, P.O. 12.3, UTE C15-712-1, G59/3, CEI 0-16

Efficiency Curve



Circuit Diagram