



You can now connect your installation



## Self-consumption with discharge of surpluses to the electricity grid

PROJECT: CCPP SAMISOL

**Solar energy canopy**

Date:

22th January 2021

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## 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

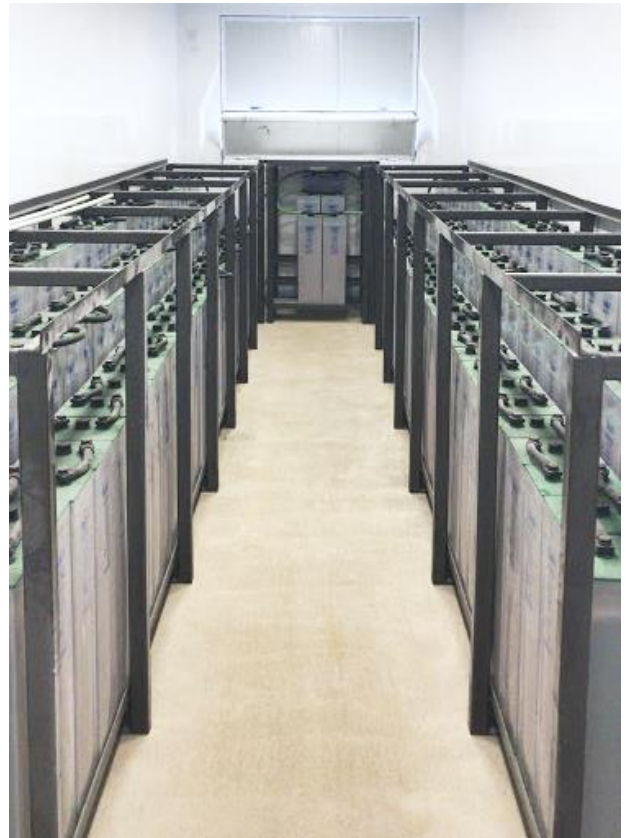
### What training do we have?

- 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





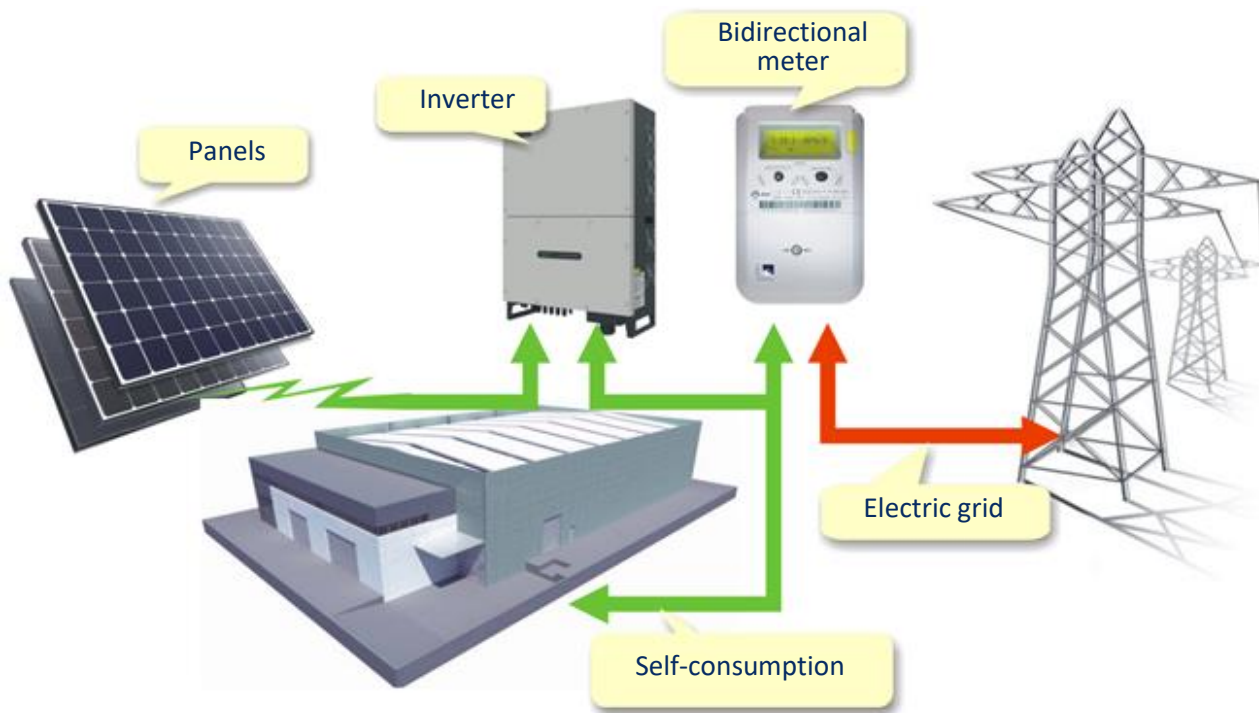
## How does self-consumption work?

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
<p><b>SII SERIES</b> Multiple upgrades were forged into one <b>390-405w</b></p>	<p>Solar panel TIER 1 listed Brand : Seraphim Power: 390 – 405W Series: S2 Monocrystalline Product warranty: 15 years Energy prod. Warranty : 25 years</p>
<p><b>JA SOLAR</b></p> <p><b>410W PERC Half-Cell Module</b> JAM72S10 390-410/PR Series</p> <p><b>Mono</b></p> <p><b>Introduction</b> Assembled with high-efficiency PERC cells, the half-cell configuration of the module offers the advantages of higher power output, better temperature-dependent performance, reduced shading effect on the energy generation, lower risk of hot spot, as well as enhanced tolerance for mechanical loading.</p>	<p>Solar panel TIER 1 listed Brand : JA SOLAR Power: 390 – 410W Series: 72S Monocrystalline Product warranty: 12 years Energy prod. Warranty : 25 years</p>
<p><b>INVERTER</b></p> <p><b>HUAWEI SUN2000 - SERIES</b></p>	<p>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.</p>

Study:

## SOLAR ENERGY STUDY

Proposal **Self-consumption with compensation of surpluses, with 36.000 Wpeak**

Customer **CCPP Samisol- Sr. Juergen**

Address

Phone

Mail

CIF

Province **Málaga**

City

**Marbella**

Made by **Domingo Calvente**

Phone **607 756 811**



## Initial conditions

### Initial conditions

In SAMISOL urbanization, there are a total of 31 single-family homes.

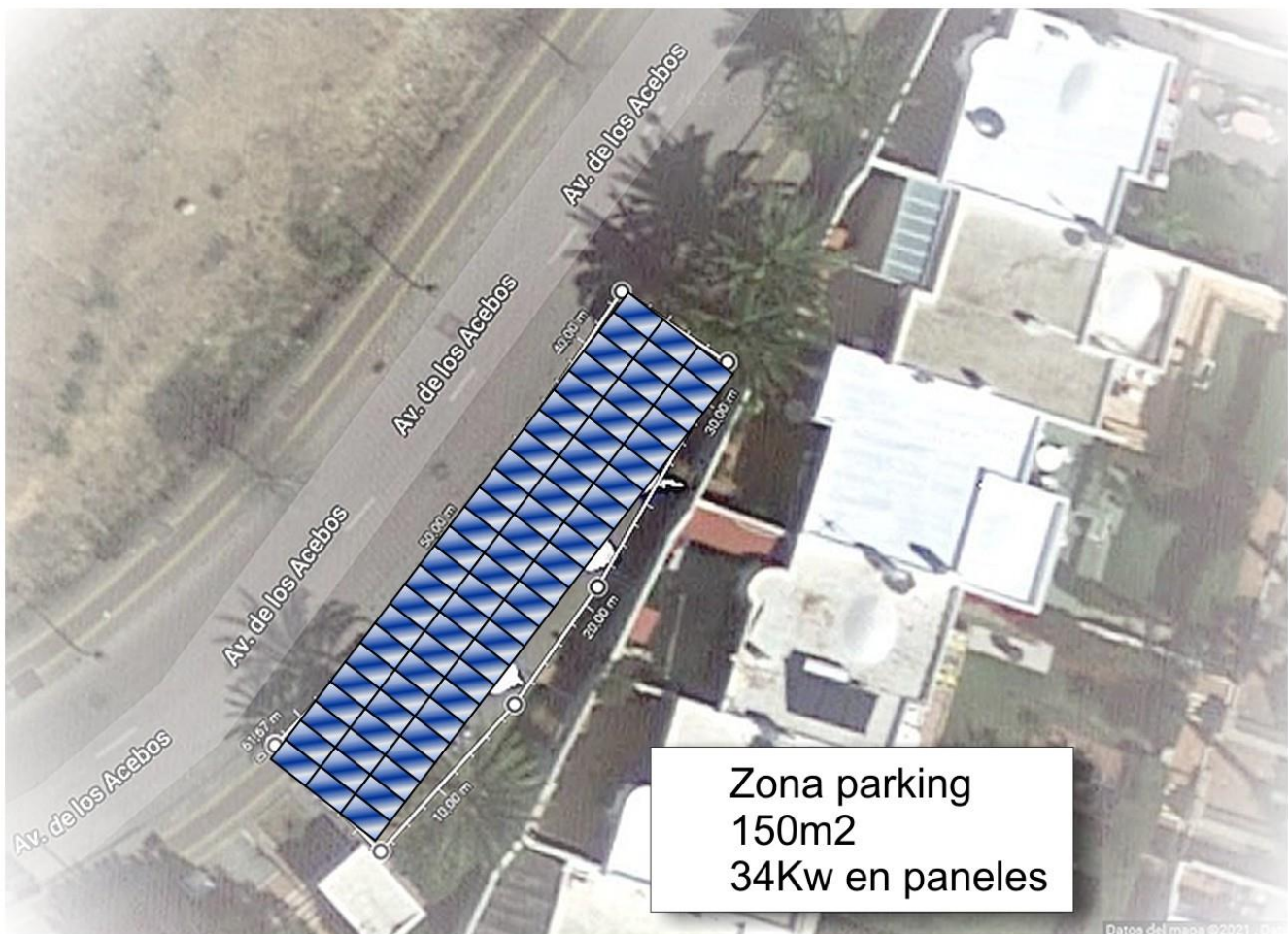
A high percentage of them are not inhabited permanently or at least 6 months or more per year.

We suggest making a smaller installation that can meet the demand of an average of 12 homes throughout the year. We estimate that the power required for this purpose is 2.4 Kw per home, the total demand is 28.8 Kw. In addition, we have to take into account the demand of common facilities, which need about 4.2Kw of panels. We have a total of 33Kw.

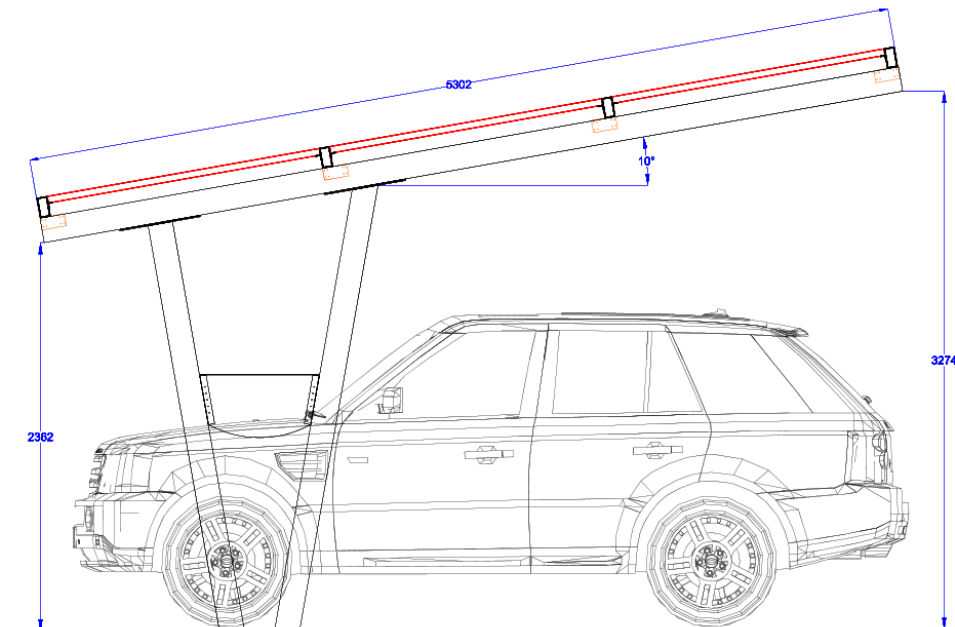
They occupy an area of 150m<sup>2</sup>.

This area is available in the common parking lot at the entrance of the urbanization.

For what we suggest as a solution to the installation of the panels, place some solar canopies, which shade the cars and also generate energy for all these uses.



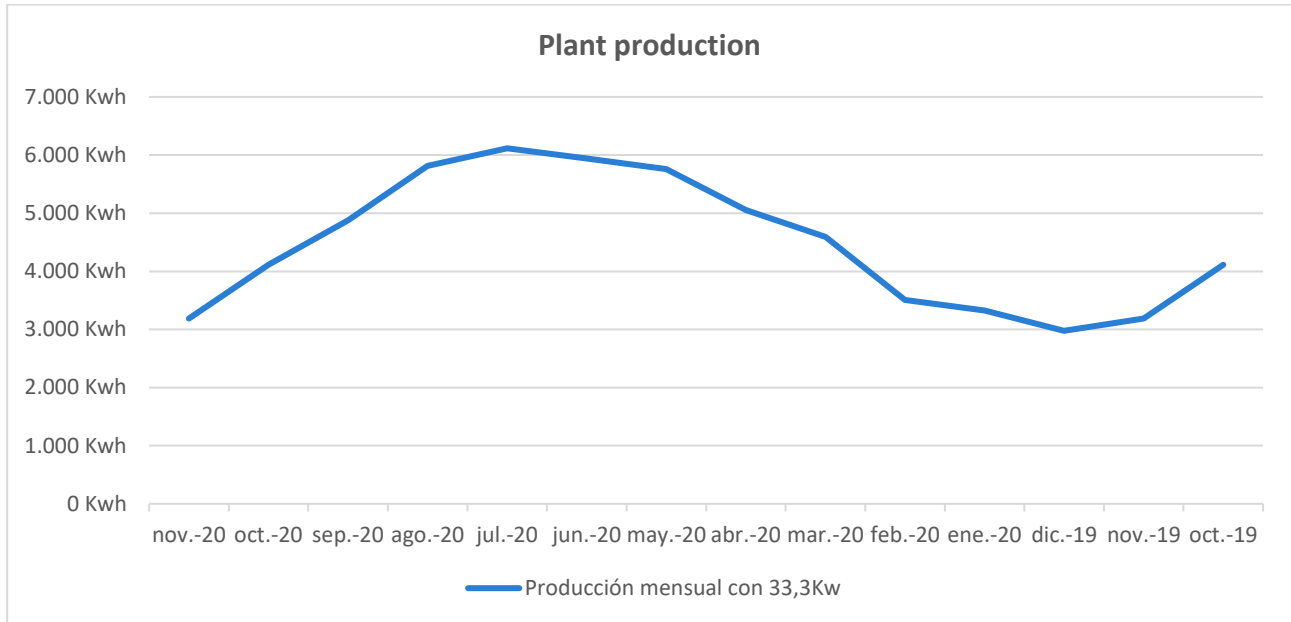
## Canopy design



Mechanically, the canopy is fixed to the ground at one point, eliminating a second fixing or leg, to facilitate the movements of the cars during the parking maneuver.



## Energy production and eco impact



**CO2 saved (year): 39.070 Kg**

**Trees equivalent (year) : 1.049**

## Budget:

### Self-consumption with compensation of surpluses, with 33.300 Wpeak

MATERIALS AND LABOR	Unit	Mat	TOTAL
FIJB Marquesina solar para parking	74	167,48 €	12.393,52 €
PB Panel solar monocristalino 450W Photovoltaic power = 33300 W	74	194,91 €	14.423,34 €
INV F Inversor Huawei 36Kw, V-200-1000v 4 MPPT	1	3.955,88 €	3.955,88 €
System peak power = 36000 W			
Pipes, cables and gutters	1	1.166,67 €	1.166,67 €
Electrical box and electrical safety elements	1	1.060,00 €	1.060,00 €
Miscellaneous (fuse box, diodes, meters)	1	1.856,80 €	1.856,80 €
Labor and commissioning	1	7.662,75 €	7.662,75 €
<b>Total budget included labour and materials</b>			<b>42.518,95 €</b>
<b>TOTAL PRICE 21% VAT INCLUDED</b>			<b>51.447,93 €</b>

### ECONOMIC AND ENERGY ANALYSIS

Installation location : Marbella - Province : Málaga

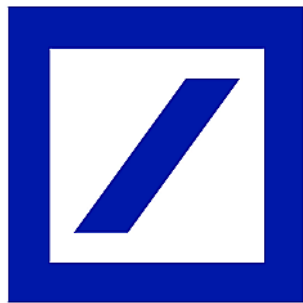
Sun hours (year)	<b>1.659</b>
Year energy production	<b>55.263 Kw/año</b>
Energy price paid	<b>160,00 €/Mw</b>
Money saved per year	<b>8.842 €</b>
Return time (years)	<b>5,8</b>



# FINANCIAL SUGGESTIONS



*Credit line with Deutsche community line*



## Deutsche Bank

Investment	<b>51.448 €</b>	VAT INCL
Year interest	<b>3,00%</b>	Not binding
Amortization period	<b>10 years</b>	
Monthly payments	<b>12 months</b>	
<b>Monthly fee</b>	<b>497,00 €</b>	

### Other financial options

Amortization period (years)	<b>5</b>
Monthly payments	<b>924,00 €</b>

Amortization period (years)	<b>7</b>
Monthly payments	<b>680,00 €</b>

## Sharing credit suggestion.

**Deutsche bank** green communities' line does not require that the community open a new account.

They issue monthly a receipt to the community bank account.

So, the only question is how the community will handle the amount to be paid by each owner.

The way to share the financial cost of the installation must be proportional to the use that each home makes of the installation.

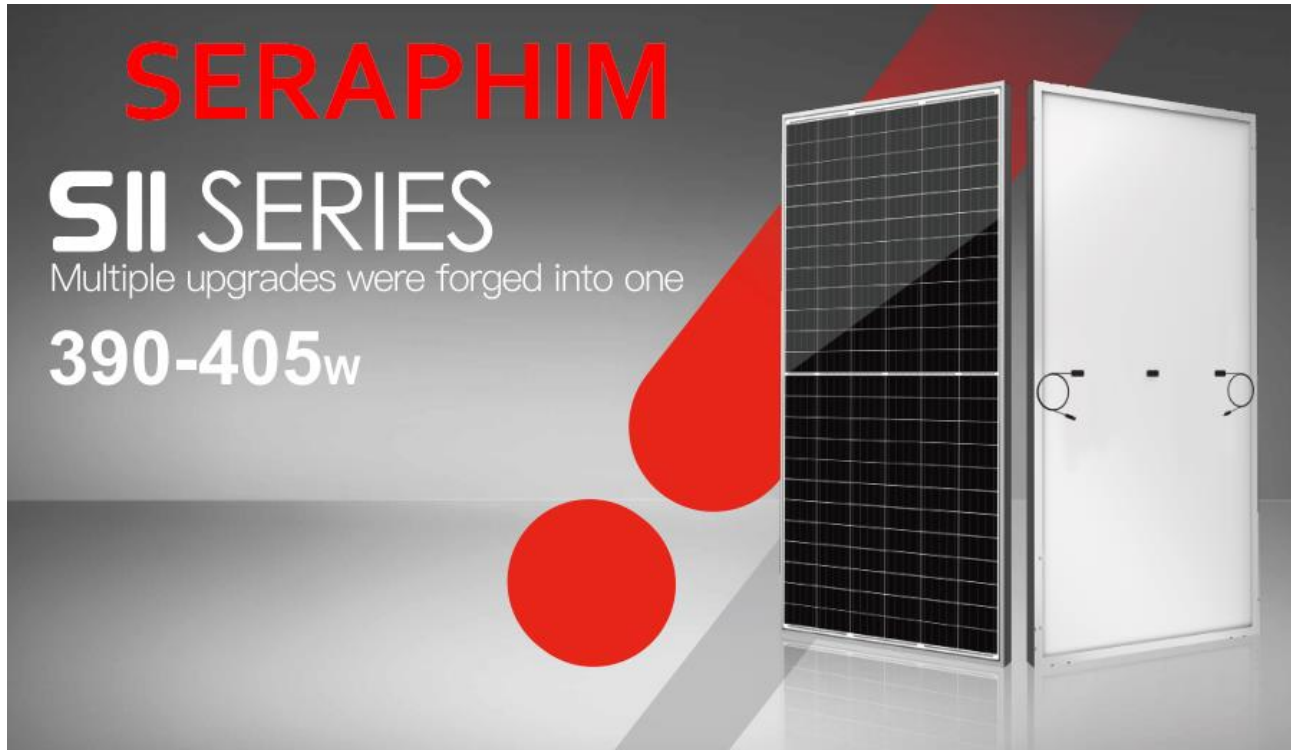
While it is true that with 34Kw, there is not enough power for all 31 simultaneously, this condition is very unlikely to occur.

And with an occupancy of 50% or less, the installation will produce enough energy, so that the consumption of the occupied dwellings all year round, is € zero per month to which must be added the price of the fixed power term of each bill, this it is equivalent to real energy cost savings of around 60-65% for year-round homeowners.

This table is one possible way to compensate monthly receipt, depending owner's occupancy.

Monthly fee	497,00 €	
Houses occupied	Fee	
31	16,03 €	per house
24	20,71 €	per house
20	24,85 €	per house
14	35,50 €	per house
10	49,70 €	per house

## 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.
- PVEL** 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

ISO19001 / ISO14001 / OHSAS18001

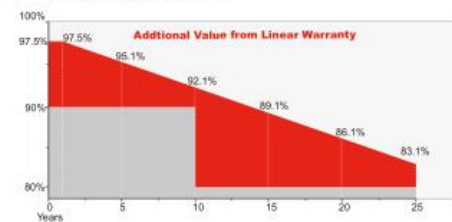
### • PRODUCT CERTIFICATION



### • INSURANCE



### • WARRANTY



Guarantee on product material and workmanship



linear power output warranty

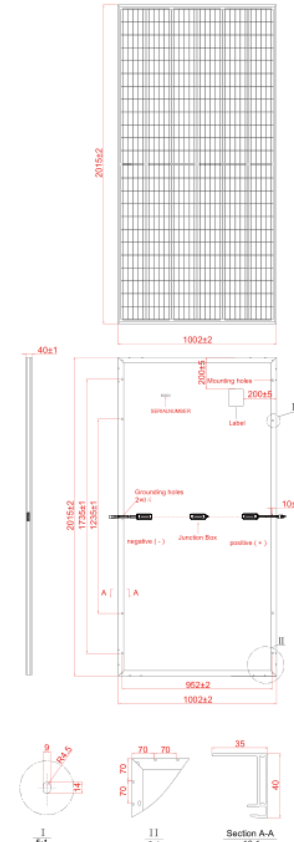




## Electrical Characteristics

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/m<sup>2</sup> 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

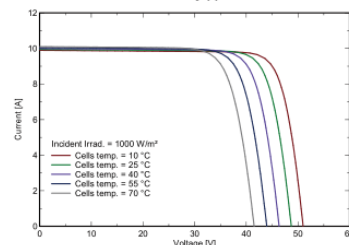
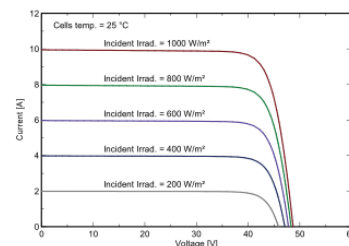
External Dimensions	2015 x 1002 x 40 mm
Weight	23.0kg
Solar Cells	PERC Mono crystalline 158.75 × 79.375 mm(144pcs)
Front Glass	3.2 mm AR coating tempered glass, low iron
Frame	Anodized aluminium alloy
Junction Box	IP68, 3 diodes
Output Cable	4.0 mm <sup>2</sup> , Portrait:255mm(+)/355mm(-);Landscape:1200mm
Mechanical Load	Front side 5400Pa/ Back side 2400Pa

## 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.

## I-V Curve





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

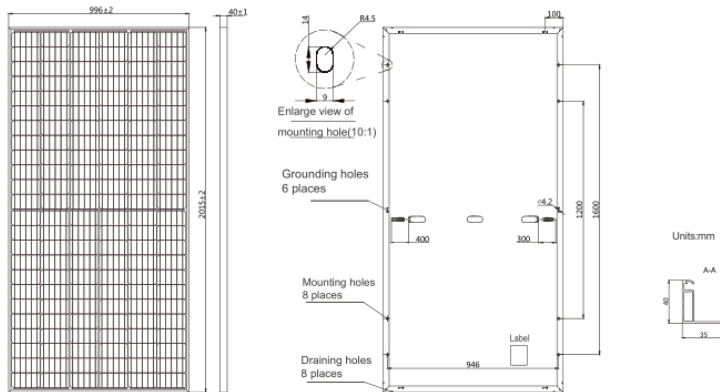


### Comprehensive Certificates

- 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



**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	4mm <sup>2</sup>
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 <sub>Isc</sub> )	+0.051%/°C				
Temperature Coefficient of Voc(β <sub>Voc</sub> )	-0.289%/°C				
Temperature Coefficient of Pmax(γ <sub>Pmp</sub> )	-0.360%/°C				
STC	Irradiance 1000W/m <sup>2</sup> , 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**

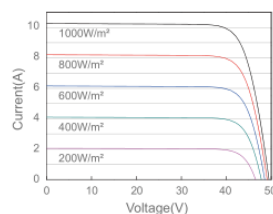
TYPE	JAM72S10 -390/PR	JAM72S10 -395/PR	JAM72S10 -400/PR	JAM72S10 -405/PR	JAM72S10 -410/PR
Rated Max Power(Pmax) [W]	289	292	296	300	303
Open Circuit Voltage(Voc) [V]	45.04	45.30	45.56	45.81	46.06
Max Power Voltage(Vmp) [V]	37.29	37.52	37.76	38.03	38.28
Short Circuit Current(Isc) [A]	8.18	8.23	8.28	8.33	8.38
Max Power Current(Imp) [A]	7.74	7.79	7.84	7.88	7.93
NOCT	Irradiance 800W/m <sup>2</sup> , ambient temperature 20°C, wind speed 1m/s, AM1.5G				

**OPERATING CONDITIONS**

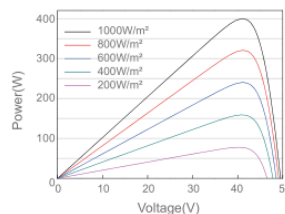
Maximum System Voltage	1000V/1500V DC(IEC)
Operating Temperature	-40°C~+85°C
Maximum Series Fuse	20A
Maximum Static Load,Front	5400Pa
Maximum Static Load,Back	2400Pa
NOCT	45±2°C
Application Class	Class A

**CHARACTERISTICS**

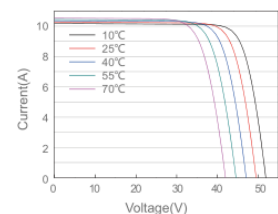
Current-Voltage Curve JAM72S10-400/PR



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

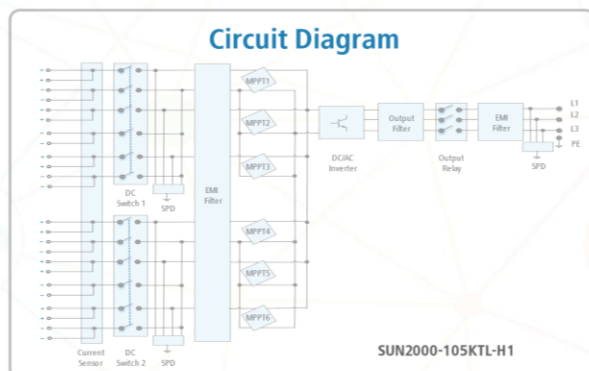
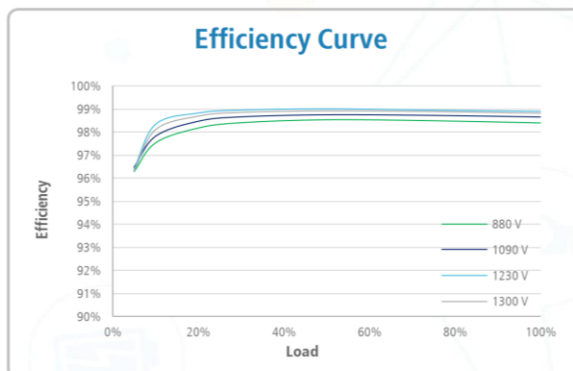
- Max. efficiency 99.0%
- European Efficiency 98.8%
- 6 MPPT per unit, effectively reducing string mismatch

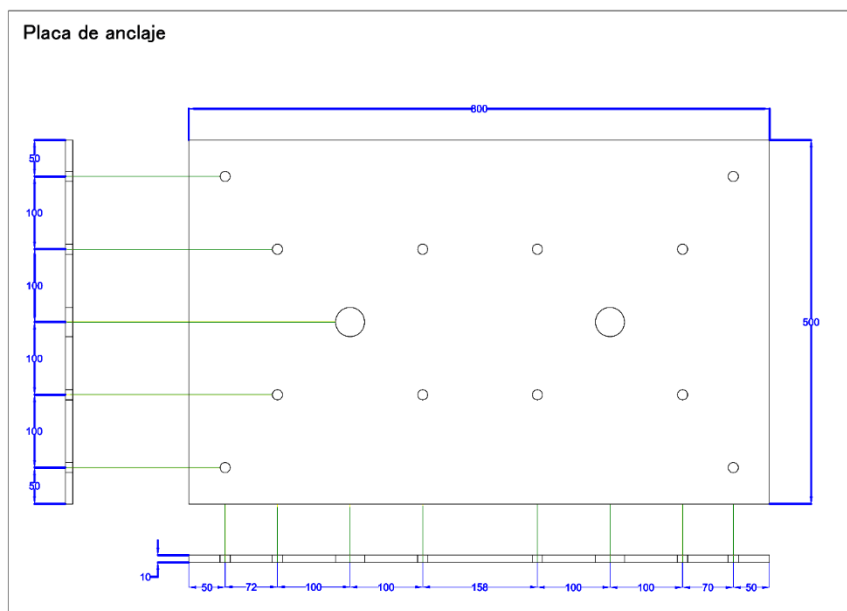
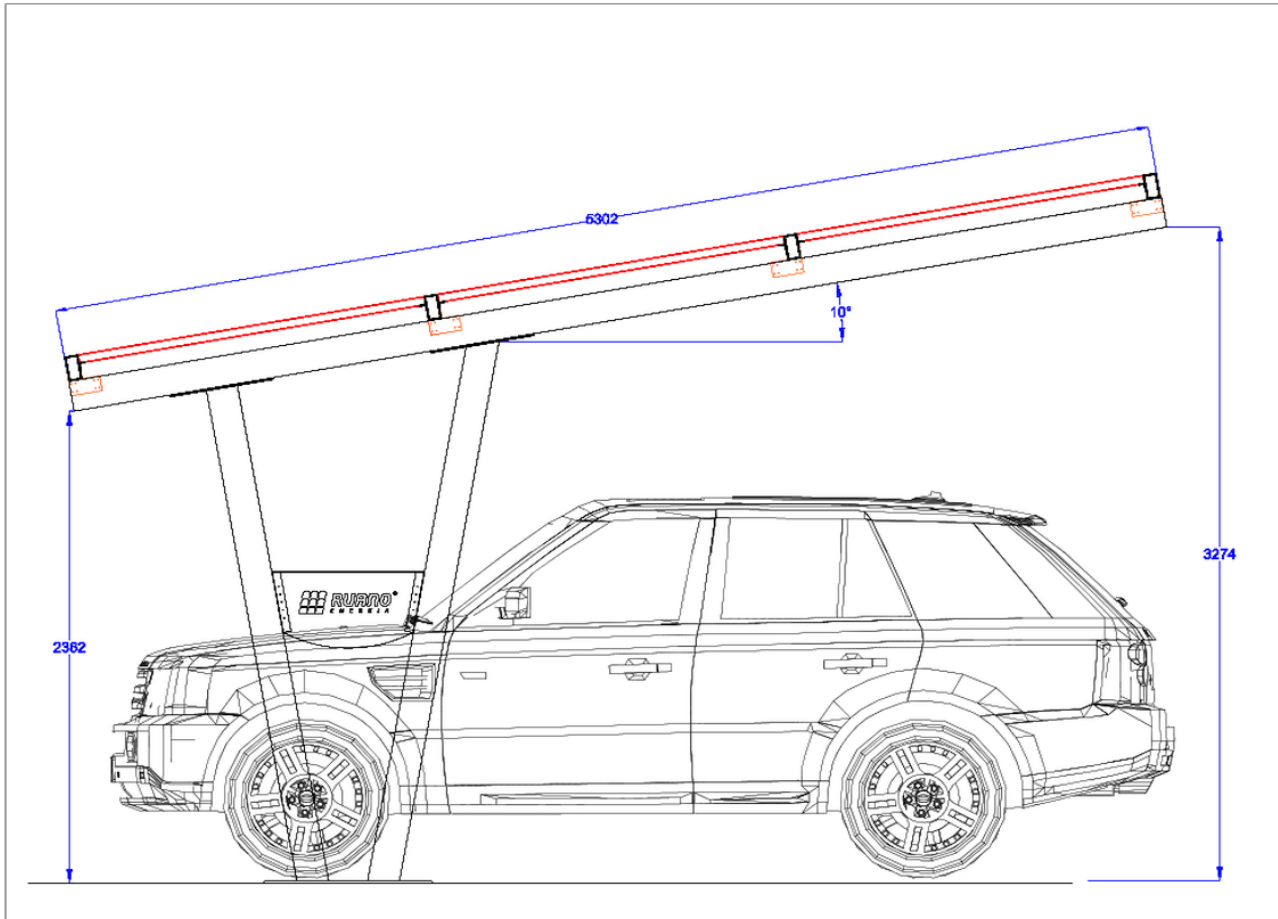
### Reliable

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

## Smart String Inverter (SUN2000-105KTL-H1)

Technical Specifications	SUN2000-105KTL-H1
	<b>Efficiency</b>
Max. Efficiency	99.0%
European Efficiency	98.8%
	<b>Input</b>
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
	<b>Output</b>
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%
	<b>Protection</b>
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
	<b>Communication</b>
Display	LED Indicators, Bluetooth + APP
RS485	Yes
USB	Yes
Power Line Communication (PLC)	Yes
	<b>General</b>
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
	<b>Standard Compliance (more available upon request)</b>
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





## *Funding application documentation:*

- 1. Deed of incorporation and granting of powers.***
- 2. Identification document of the company (NIF).***
- 3. DNI of the administrator and / or the signer.***
- 4. Information on the annual accounts for the last two years, including the attached report.***
- 5. Declaration of Corporation Tax and the Commercial Registry.***
- 6. Model 347 and 390 of 2.018***
- 7. Model 303 for all quarters of 2018 and 2019***
- 8. Model 200 (IS) of 2017 and 2018***
- 9. Proof of payment of Social Security and Finance.***
- 10. VAT returns for the last fiscal year and provisional balances for the current fiscal year.***
- 11. Declaration of assets of the company.***
- 12. "Bank Pool", list of bank accounts with which it operates.***