

# SOLAR ENERGY KIT MODEL: SEM-CS3000



## Introduction:

SITECNO solar energy kit is on-grid PV system, a complete solution which generates electrical energy for self-consumption and feed surplus energy in to the grid as per legislation of the country. Solar PV panels generates DC electric power when exposed in sun light. High efficiency MPPT PV inverter converts DC electric power in to AC electric power for consumption in load. Grid power supply is connected in parallel circuit with PV inverter AC output. Solar generated electric power has first priority for consumption in load and additional power can be retrieved from the grid supply if required. Solar energy system can be hybrid with diesel generator power for the operation as PV-diesel hybrid system. Solar energy system is useful for saving in electricity bill, saving in diesel fuel consumption and source of income by selling surplus energy to the grid.

## PV System output :

|      |     |                                       |
|------|-----|---------------------------------------|
| 3000 | Wp  | Solar PV Power ongrid kit             |
| 14,4 | kWh | Energy generation per day (average)   |
| 432  | kWh | Energy generation per month (average) |

## Equipment and components list:

| Quantity |        | Description  |
|----------|--------|--|
| 12       | 250 Wp | Solar photovoltaic Si-polycrystalline panels             |
| 1        | 3 kW   | Solar PV ongrid inverter 1 Play O/P 220-230V, 50Hz       |
| 12       | unit   | Aluminium support structure for solar PV panels mounting |
| 54       | m      | DC cables 6mm R1000 PV panel to inverter                 |
| 5        | m      | AC cable 2 core inverter to main breaker                 |
| 6        | pair   | Solar PV cable connectors MC4                            |
| 1        | set    | Support structure installation tools                     |
| 1        | set    | Instructions manual for installation                     |
| 1        | set    | Electrical design layout                                 |

## SYSTEM WARRANTY:

|                           |  |
|---------------------------|--|
| Solar modules production: | 25 years                                   |
| Module support structure: | 25 years                                   |
| Inverters:                | 5 years standard, (extendible to 25 years) |

## Quality of Components:

All equipment and components in the kit are manufactured in EU with high quality CE standard.

### ***Kits advantages***

- Easy to organize the order through a unique code and provider.
- Compatibility between all components secured.
- Measurement of energy flows installation.
- CE highest quality components.
- Support structure with pre-design to facilitate plug & play mounting installation.

### ***Function of the system***

1. The load consume the solar energy produced by photovoltaic modules during the day hours time, plus the excess energy can be feed in to the grid as per legislation of the country.

2. The diesel generator connection is an other option when the load does not get enough solar energy, and there is instability in the grid supply network. In these situations the customer consumes energy from diesel generator.

### ***Modular system***

These systems are modular type and can be installed as per your space and requirement. You can ask for additional services as state-of-the-art designing, drawings, engineering and installation of your projects.

Solar kits with modular system can be extended to MW size projects

### ***Solar Kit Applications:***

- |                                      |                         |                          |
|--------------------------------------|-------------------------|--------------------------|
| • Schools                            | • Hospitals             | • Hotels                 |
| • Restaurants                        | • Resorts               | • Scout camps            |
| • Gymnasium                          | • Service centres       | • Petrol Stations        |
| • Gardens                            | • Multi story buildings | • Old houses             |
| • Markets                            | • Shopping malls        | • Public service offices |
| • Electric vehicle charging stations | • Parking Areas         |                          |
| • Administration buildings           |                         |                          |

### ***Additional Accessories***

Ask for additional accessories for extension at your installation or shifting of your PV system to another place.

### ***Installation Training Services***

Training of installation is offered for technical persons on time to time basis. Schedule of the training session announce on web site.

### ***Operation and maintenance services***

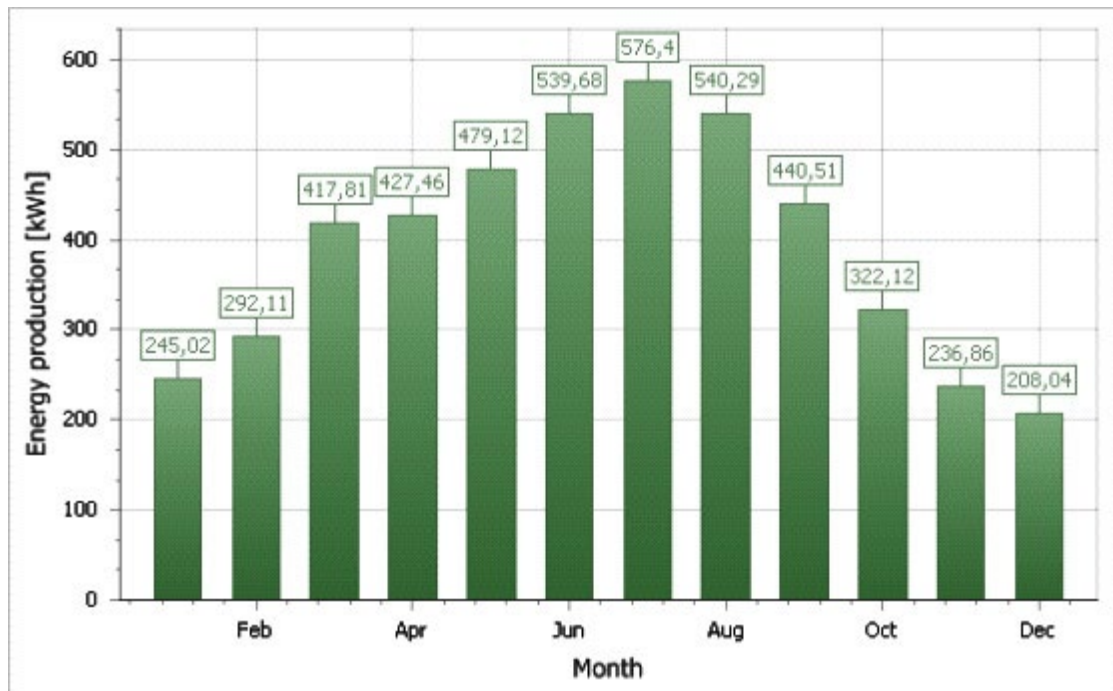
Operation and maintenance services offered for the valued customers for efficient operation of the system. Customers may ask for O&M service contract with the company.

### ***Monitoring services***

In order to monitor solar power generation and consumption from PV system, data can be transmitted to remote locations. For communication between the solar inverter and monitoring devices, SITECNO provides two basic choices: Wireless or Blue-tooth and wired variants.

## ANNUAL ENERGY PRODUCTION by SOLAR ENERGY KIT MODEL: SEM-CS3000

(annual global direct irradiation 2,97 kWh/m<sup>2</sup> in Madrid. Ref: source NASA-SSE)



### INSTALLATION APPLICATION

- Instant self-consumption system with feed in grid (on grid)
- Instant self-consumption system without feed in to the grid (on grid)
- Solar system hybrid with diesel generator (on grid)



## Polycrystalline Solar Module 250W

SITECNO Solar Photovoltaic Panels stand for quality, durability and most importantly, high performance. Our experience, capacity of research, continuing development and improvement have turned us into a company recognized in the sector by the high value offered to our clients.

Due to their engineered hollow section frame and its 4mm special textured glass with AR coating, SITECNO modules meet the maximum demands with regard to stability and corrosion resistance.

Thanks to their high performance SITECNO modules are prepared for changes in legislation. These panels will produce 5% more than any other of the same features.

The performance warranty is for 25 years, after 12 years, modules still produce a minimum 90% of their nominal performance. After 25 years module still produce a minimum 80% of their nominal performance.

### Electrical Characteristics:

|                                       |            |
|---------------------------------------|------------|
| MODEL                                 | SI-P60-250 |
| Nominal Power (Pmax)                  | 250W       |
| Open Circuit Voltage ( $V_{OC}$ )     | 37,5V      |
| Short Circuit Current ( $I_{SC}$ )    | 8,76A      |
| Voltage at Nominal Power ( $V_{mp}$ ) | 30,3V      |
| Current at Nominal Power ( $I_{mp}$ ) | 8,24A      |
| Module Efficiency (%)                 | 15,20      |

### Mechanical Characteristics:

|                  |                             |
|------------------|-----------------------------|
| Cell type        | Polycrystalline 156x156mm   |
| Number of cells  | 60 (6x10)                   |
| Module dimension | 1660 x 990 x 50mm           |
| Weight           | 20kg                        |
| Front cover      | TSG low-iron tempered glass |
| Frame            | Aluminium alloy             |
| Junction box     | IP65, 3diodes               |
| Cable length     | 1200mm (+) , 800mm(-)       |
| Connector        | PV-JM601                    |

### Temperature Coefficients:

|                                    |                  |
|------------------------------------|------------------|
| Nominal Operating Cell Temperature | 25°C ±2°C        |
| Temperature Coefficients of Pmax   | -0.43% / °K      |
| Temperature Coefficients of Voc    | -0.31% / °K      |
| Temperature Coefficients of Isc    | 0.04% / °K       |
| Operating Temperature              | -40 °C to +85 °C |
| Maximum System Voltage             | 1000V DC         |
| Reverse current load               | 15A              |



## SUN 1 PLAY 3TL M

The SUN 1Play TL M inverters have been designed to maximize the power generation and also to facilitate user access to the PV plant. This solar inverter family is valid for low kilowatt residential applications, and also for decentralized commercial and industrial systems rated up to several hundred kilowatts. Thanks to this High efficiency system and to the use of innovative electronic conversion topologies, values of up to 98% can be achieved. Every inverter can be accessed from either a remote PC or on site from the inverter front touch key-pad through its LCD screen. The display also features a number of LEDs to indicate the inverter operating status.

### ***BENEFITS***

- The best possible price.
- High efficiency rates.
- Easy maintenance.
- Standard 5 year warranty, extendible for up to 25 years.

### ***MAIN FEATURES***

- Compatible with 30 mA RCDs.
- Double-MPPT system.
- Available from 2.5 up to 6 kW.
- 98% maximum efficiency.
- SiC Technology inside.
- Inverter updating by the user through a SD memory card.
- USB communications supplied as standard.
- Software SUN Manager for PV plant access and data registration.
- Software SUN Monitor for PV plant monitoring.
- LCD Display.
- Easy maintenance.
- Suitable for indoor and outdoor installations (IP65).
- Display-configurable potential free contact, to indicate insulation fault or grid connection.
- Compact design.
- Language, Country Code and rated voltage configurable by display.



The SUN 1Play inverters feature have been designed to obtain the maximum power from the PV array and to facilitate user access to the PV installation. Thus, this single-phase inverter family features renewed benefits that place them at the forefront of today's market.

### ***PROTECTIONS***

- Reverse polarity.
- Short circuits and overloads at the output.
- Anti-islanding with automatic disconnection.
- Insulation faults.

### ***OPTIONAL ACCESSORIES***

- Inverter communication via RS-485,
- Ethernet, Bluetooth, Wi-Fi or GSM / GPRS.
- DC switch.
- SUN Weather-box for meteorological values measurement and registration.
- Digital inputs.
- Self-consumption kit.

## PV INVERTER TECHNICAL SPECIFICATION

### Input (DC)

|  |             |
|--|-------------|
| Recommended PV array power range <sup>(1)</sup>            | 3.2 - 4 kW  |
| Voltage range MPPT   | 100 - 450 V |
| Min. voltage for P <sub>nom</sub> at rated V <sub>ac</sub> | 195 V       |
| Maximum voltage <sup>(2)(3)</sup>                          | 550 V       |
| Maximum current <sup>(4)</sup>                             | 17 A        |
| Inputs (input 1) <sup>(5)</sup>                            | 3           |
| MPPT   | 1           |

### Output (AC)

|                           |                              |
|---------------------------|------------------------------|
| Rated power               | 3 kW                         |
| Maximum current           | 13.5 A                       |
| Rated voltage             | 230 / 240 V                  |
| Frequency                 | 50 / 60 Hz                   |
| Phi Cosine <sup>(6)</sup> | 1                            |
| Phi Cosine adjustable     | Yes. S <sub>max</sub> =3 kVA |
| THD                       | <3%                          |

### Efficiency

|                    |        |
|--------------------|--------|
| Maximum efficiency | 96.6 % |
| Euro efficiency    | 95.1 % |

### General Information

|                                     |   |
|-------------------------------------|---|
| Refrigeration system                | Air 30 m <sup>3</sup> /h  |
| Stand-by consumption <sup>(7)</sup> | <10 W   |
| Consumption at night                | 0 W   |
| Ambient temperature                 | -20 °C to 70 °C   |
| Relative humidity (non-condensing)  | 0 - 100%  |
| Protection class                    | IP65  |
| Marking                             | CE  |
| EMC and security standards          | EN 61000-6-1, EN 61000-6-2, EN 61000-6-3, EN 61000-6-4, EN 61000-3-2, EN 61000-3-3, EN 61000-3-11, EN 61000-3-12, EN 62109-1, EN 62109-2, IEC62103, EN 50178, FCC Part 15, AS3100   |
| Grid connection standards           | RD1699/2011, DIN V VDE V 0126-1-1, EN 50438, CEI 0-16 Ed. III, CEI 0-21, VDE-AR-N 4105:2011-08, G59/2, G83/2 <sup>(8)</sup> , P.O.12.3, AS4777.2, AS4777.3, IEC 62116, IEC 61727, UNE 206007-1, ABNT NBR 16149, ABNT NBR 16150, South African Grid code, Chilean Grid Code, Romanian Grid Code, Ecuadorian Grid Code, Peruvian Grid code, IEEE 929, Thailand MEA & PEA requirements, DEWA (Dubai) Grid Code, Jordan Grid Code |

**Notes:** (1) Depending on the type of installation and geographical location (2) Must not be exceeded under any circumstances. Consider the voltage increase of the 'Voc' at low temperatures (3) The maximum current per PV connector is 11 A (4) Optionally, the DC inputs could be duplicated (5) For each °C of increase, the output power will be reduced at the rate of 1.8% (6) For P<sub>out</sub>>25% of the rated power (7) Consumption from PV field (8) Related only to inverters up to 16 A.

## KIT COMPONENTS

### **Design**

Technical feature

Weight

Loads

Test certificate

### **Modular type**

Aluminium

25 years warranty

Tamper proof nut bolt

100% recyclable material

A2 Stainless steel bolts

2,49kg/m

wind, snow

CE Certifies

### **Cable:**

· Model:

· Rated Voltage:

· Rating Current:

· Cable Size:

· Proof Voltage:

· Protection Class:

· Temperature Range:

· Flame class:

SI-MC4-F

TUV 1500V DC / UL 600V DC

20-30A

2.5-4.0-6.0, 10-12-14AWG

TUV 1500V AC, 1 min

Class II

-40 to 85°C

UL94-V0

### **Connector:**

Flexible conductor,

Maximum service temperature:

Estimated lifetime

UV Resistant UV Resistant

Grease & mineral oils resistance:

Grease & mineral oils resistance:

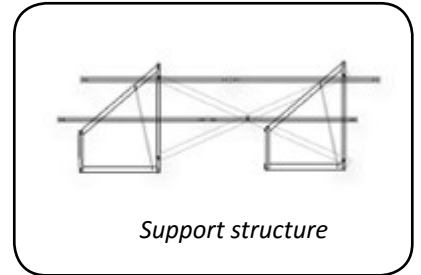
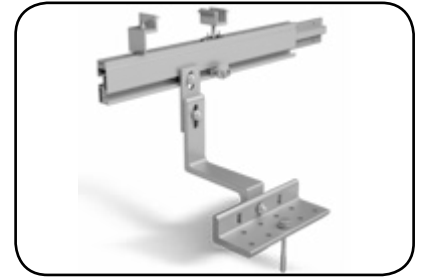
class 5

120°C

30 years.

excellent

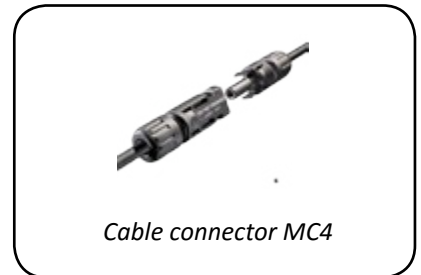
excellent



*Support structure*



*Cable with connector*



*Cable connector MC4*

## ORDER REFERENCES NUMBER

| REF.# | Model#     | Description  | PVP        |
|-------|------------|--|------------|
| 14006 | SEM-ES3000 | Complete plug and play without support structure     | 5.436,31 € |
| 14106 | SEM-CS3000 | Complete plug and play with all necessary components | 7.021,93 € |



*Authorised distributor:*

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