SOLAR KIT MODEL: SI-HST12000

12000 Solar PV Hybrid Kit
57600 Wh per day
1728 kWh per month

<table>
<thead>
<tr>
<th>Quantity</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>48</td>
<td>Solar panels 250W Polycrystalline</td>
</tr>
<tr>
<td>3</td>
<td>Solar hybrid inverter 5000VA</td>
</tr>
<tr>
<td>24</td>
<td>Battery bank 12V 105AH or equivalent</td>
</tr>
<tr>
<td>3</td>
<td>Support structure for solar panels</td>
</tr>
<tr>
<td>3</td>
<td>15m DC cables 1x5.6mm R1000 2 core PV panel to charge controller with thimble at ends</td>
</tr>
<tr>
<td>3</td>
<td>2m DC cables 1x5,6mm R1000 2 core battery to hybrid inverter with thimble at ends</td>
</tr>
<tr>
<td>3</td>
<td>1 x 0.5m DC cables 1x5,6mm R1000 2 core battery interconnection with thimble at ends</td>
</tr>
<tr>
<td>3</td>
<td>5m AC cable 1x5,6mm R1000 2 core inverter to main breaker with thimble at ends</td>
</tr>
<tr>
<td>1</td>
<td>1 pair Solar connector MC4</td>
</tr>
<tr>
<td>1</td>
<td>1 installation tool kit</td>
</tr>
</tbody>
</table>

SYSTEM WARRANTY*:
Solar modules production: 25 years
Module support structure: 25 years
Inverters: 5 years standard, (extendable to 25 years)
Battery: 1 year (10 years life)

Quality of Components:
Manufactured in EU.
All components in the kit are high quality with CE standard

Description
SITECNO solar kits for hybrid system with diesel generator, batteries and grid are complete solutions which also provide energy in all unforeseen situations that may lead either by time, by circumstances of outage and any situation. It is a complete solution for saving your energy costs and fuel.

Kits advantages
Function of the system

1. The place uses the solar energy produced by photovoltaic modules during the hours of sun, plus the excess energy store in the batteries.

2. The battery is second choice after solar energy and the first choice for the night. In the absence of solar energy, either by night or unstable climate. The place will feed by the energy stored in batteries.

3. The grid is a third option, when the energy stored in the batteries is not enough, the load consumes energy from the grid and also charge the batteries.

4. The diesel generator is the last option when the load does not get solar energy, batteries do not have enough stored energy or are empty, and there is load shedding in the grid. In these situations the location consumes energy from diesel generator and also charges the batteries.

Modular system

These systems are module 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 projects

Solar Kit Applications:

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

Additional Accessories

You can ask for additional accessories for extension at your installation or shifting of your 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 the O&M service contract with the company.

Monitoring services

In order to monitor solar power systems, 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.
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 (VOC):** 37.5V
- **Short Circuit Current (ISC):** 8.76A
- **Voltage at Nominal Power (Vmp):** 30.3V
- **Current at Nominal Power (Imp):** 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 (NOCT):** 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 ºC to +85 ºC
- **Maximum System Voltage:** 1000V DC
- **Reverse current load:** 15A
SITEC 4500-H is designed to serve as a backup power supply for AC loads. The input power of SITEC 4500-H comes from PV system and AC grid which not only supply power to AC loads but also charge the battery bank when the power from AC grid or AC generator is present (also known as Line Mode).

In the event of AC grid (or AC generator) outage, the AC loads can be alternatively powered by PV system (if the illumination is sufficient) and battery bank. Please find below the system diagram of typical application.

SITEC 4500-H can automatically enter 9 different operation modes depending on the status of DC input power (PV) and AC input power. Please refer to the following table for the 8 operation modes and their corresponding conditions.

**AC Input GRID Power Present:**
- **Strong PV Power:** LINE-PV or SOLAR-PV
- **Less PV Power:** LINE-HYBRID or SOLAR-HYBRID
- **No PV Power:** LINE MODE
- **No PV Load:** CHARGE MODE

**AC Input GRID Power Absent:**
- **Strong PV Power:** INV-PV
- **Less PV Power:** INV-HYBRID
- **No PV Power:** INV MODE
- **No PV Load:** CHARGE MODE

**LINE-PV**
AC loads are supplied by AC grid (or AC generator), and DC input power (PV) is strong enough to charge battery bank without consuming AC power.

**LINE-HYBRID Mode**
AC loads are supplied by AC grid (or AC generator). The power used to charge battery bank firstly comes from PV system and the rest comes from AC grid (or AC generator).

**LINE MODE**
As DC input power is too low, AC grid (or AC generator) not only supplies AC loads but also charges battery bank.

**INV-PV Mode (Inverter-PV Mode)**
AC loads are supplied by PV system as backup power without consuming the power from battery bank, and surplus PV power will charge the battery if AC loads is less than 2.1kW.

**INV-HYBRID Mode (Inverter-Hybrid Mode)**
AC loads are supplied firstly by PV system and the rest by battery bank. The power from PV system helps to prolong the backup time.

**INV Mode (Inverter Mode)**
AC loads are supplied only by the battery bank.

**CHARGE Mode (Charging Mode)**
When AC grid is not available, PV system can take over to charge the battery as long as no AC load is connected.
Solar Mode
SOLAR MODE is a special mode which can be enabled via lower control panel (please refer to Section 3.5). SOLAR MODE allows the AC loads to better utilize the power from PV system and consume less power from AC grid (or AC generator) during the LINE MODE. After enabling SOLAR MODE, SITEC4500-H will automatically enter into SOLAR MODE when the PV power is strong and battery bank is charged to >90% capacity (as shown in the diagram below).

Solar-PV Model
When DC power is strong, AC loads are supplied only by PV system without consuming power from AC grid (or AC generator), and surplus PV power will charge the battery if AC loads is less than 2.1kW.

Solar-Hybrid Model
When DC power is less strong, AC loads are supplied by both PV system and battery bank without consuming power from AC grid (or AC generator). When the PV power is low or battery bank is discharged to <60%, SITEC4500-H will leave Solar Mode.

Saver Mode
SAVER MODE is a power-saving mode which can be enabled by via upper control panel (please refer to Section 3.4). SAVER MODE allows the product to operate with less power consumption (tare loss) under light-loaded condition.

TECHNICAL SPECIFICATION
DC Input (PV Tracker)
Max. Input DC Power: 4500W
Initial Feed-in Voltage: 160Vdc
Working Voltage Range Full: 130 ~ 300Vdc
Rating Voltage Range Max.: 185 ~ 300Vdc
DC Current: 24.3A
Max. DC Short-circuit Current: 30.4A

AC Input / Output (Line Mode)
Input Voltage Waveform: Sinusoidal (utility or generator)
Nominal Input Voltage: 230Vac
Low Line Disconnect: 170Vac±4% (normal range), 90Vac±4% (generator / wide range)
Low Line Re-connect: 180Vac±4% (Normal), 100Vac±4% (generator / wide range)
High Line Disconnect: 280Vac±4%
High Line Re-connect: 270Vac±4%
Max AC Input Voltage: 300Vac rms
Nominal Input Frequency: 50Hz / 60Hz (auto detection)
Low Line Frequency Disconnect: 40±1Hz
Low Line Frequency Re-connect: 42±1Hz
High Line Frequency Disconnect: 65±1Hz
High Line Frequency Re-connect: 63±1Hz
Output Voltage Waveform: As same as input waveform
Output Short-Circuit Protection: Circuit Breaker 40A
Efficiency (Line Mode): >95% (Rated R load, battery full-charged)
Transfer Switch Rating: 40A
Transfer Time (AC to DC): 10ms (typical), 15ms max(Normal range setting), 20ms (typical), 40ms max(generator/wide range setting)
Transfer Time (DC to AC):

- 10ms (typical), 15ms max (Normal range setting), 20ms (typical), 40ms max (generator/wide range setting)

**AC Output (Inverter Mode)**

- Output Voltage Waveform: Pure Sine Wave
- Nominal Output Power: 5000VA
- Power Factor: 0.84
- Nominal Output Voltage: 230Vac
- Output Frequency: 50Hz / 60Hz ± 1Hz (automatic detection)
- Output Voltage Regulation: ±10% rms
- Max. Efficiency (DC to AC): >95%
- Over-Loading Protection:
  - fault after 5s @≥150% load,
  - fault after 10s @110%~150% load
- 10,000VA

**Surge Rating:**
- Electric Motor Start-up Capability: 2.5HP
- Output Short-Circuit Protection:
- Rating of Bypass Circuit Breaker: 40A
- Nominal DC Input Voltage: 48V
- Min DC Start-up Voltage: 40V

**Battery Charger**

- Nominal Input Voltage: 230Vac
- Input Voltage Range:
  - 180V~270Vac (normal range), 100V~270Vac (generator/wide range)
  - Subject to the battery type
- Nominal Output Voltage: Subject to the battery type
- Nominal Charge Current:
  - 20A (95-175V) for generator/wide range,
  - 35A (175-275V) @35A setting,
  - 20A (175-275V) @20A setting
  - ±10%
- Start-up Battery Voltage: >35Vdc
- Charger Short-Circuit Protection:
- Over-Charging Protection:
  - Bat. V ≥60Vdc, Fault, Buzzer alarm

**General Specification:**

- Safety Certification: CE (EN 62109-1/-2)
- EMI Classification: IEC 61000-6-4/IEC 61000-6-2
- Protection Degree: IP20
- Operating Temperature Range: 0°C to 45°C
- Storage Temperature: -15°C ~ 60°C
- Altitude: Elevation: 0 - 1500 Meters
- Relative Humidity: 5% to 95% non-condensing
- Audible Noise: 60dB max
- Cooling: Forced air, variable speed fan
- Dimension (WxHxD): 192.4 x 370.2 x 456 mm
- Net Weight: 17.2 kg
- Gross Weight: 20.3 kg
- Input DC Connector: MC4
- DC Output Wiring Gauge: 4AWG or larger+M8
- AC Input/Output Wiring Gauge: L/N: 10AWG, G: larger than L/N’s gauge
The rechargeable batteries are lead-lead dioxide systems. The dilute sulphuric acid electrolyte is absorbed by separators and plates and thus immobilized. Should the battery be accidentally overcharged producing hydrogen and oxygen, special oneway valves allow the gases to escape thus avoiding excessive pressure build-up. Otherwise, the battery is completely sealed and is, therefore, maintenance-free, leak proof and usable in any position.

**Type of Battery:**
- **Solar.bloc**
  - Standards: DIN40737-3 IEC896-11
  - Capacity Range: 105 AH
  - Normal Voltage range: 12V
  - Container Material: PP
  - Grid alloy (+ive, -ive): Pb + <1% Ca
  - Plates (+ive, -ive): Grid, Grid
  - Electrolyte: H2SO4, fixed in AGM
  - Application: Solar
  - Connector design: cramp / bolted connector
  - Design life up to: 10 years
  - Cycles up to: 800
  - Operating temperature: -20°C to +40°C

**Design**
- Technical feature

**Cable:**
- Model: SI-MC4-F
- Rated Voltage: TUV 1500V DC / UL 600V DC
- Rating Current: 20-30A
- Cable Size: 2.5-4.0-6.0, 10-12-14AWG
- Proof Voltage: TUV 1500V AC, 1 min
- Protection Class: Class II
- Temperature Range: -40 to 85°C
- Flame class: UL94-V0

**Connector:**
- Flexible conductor, class 5
- Maximum service temperature: 120°C
- Estimated lifetime: 30 years.
- UV Resistant
- Grease & mineral oils resistance: excellent
- Grease & mineral oils resistance: excellent
1. Photovoltaic system
2. Inverters
3. Batteries
4. Consumption
5. Grid

Load:
- Fans
- Tube lights / energy saver bulb
- TV
- Computer / Laptop
- Printer
- Juicer machine
- Microwave oven
- Refrigerator / Deep freezer
- Washing machine
- Cloth Iron
- Water pump
- Air condition