

SOLAR ENERGY KIT MODEL: SEM-C1HAT45K



Introduction:

SITECNO solar energy kit is hybrid PV system with batteries or off grid applications, which provide energy in all unforeseen circumstances. A complete solution which generates electrical energy from sun light for self-consumption and feed surplus energy in to the batteries and also 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 Hybrid 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 surplus power store in battery bank. If load is higher than solar generation power than additional power can be retrieved from the grid supply if required. If the grid is off or unstable than additional power will be retrieved from the battery bank. Different battery bank packages are available. Solar energy system can be hybrid with diesel generator 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 :

45000	Wp	Solar hybrid Kit PV Power
216	kWh	Energy generation per day (average)
6480	kWh	Energy generation per month (average)
59160	VAH	1 Hour full load backup battery bank

Available sizes of battery bank in this PV system:

117300	VAH	2 Hour full load backup battery bank
176880	VAH	3 Hour full load backup battery bank
234300	VAH	4 Hour full load backup battery bank
292800	VAH	5 Hour full load backup battery bank

Equipment and components list:

Quantity	Description
180	250 Wp Solar photovoltaic Si-polycrystalline panels
3	20 kW Solar Inverter SUN3PLAY 20TL
1	60 kW Battery inverters with built-in battery charge controller
58	170 Ah Battery bank power.com GEL-ESS 6V @C10 or equivalent
180	unit Aluminium support structure for solar panels
390	m DC cables 6mm R1000 PV panel to inverter
4	m DC cables R1000 battery to hybrid inverter
58	m DC cables battery interconnection
58	unit DC cables battery interconnection thimble
5	m AC cable 2 core inverter to main breaker
25	pair Solar connector MC4
1	set Aluminium support structure installation tools
1	set Instructions manual for installation
1	set Electrical design layout

SYSTEM WARRANTY*:

Solar modules production:	25 years
Aluminium support structure:	10 years
Inverter:	5 years standard, (extendible to 25 years)
Battery Inverter:	3 years standard, (extendible to 25 years)
Battery:	GEL: 2 years (life 10 years) / AGM (GEL -ESS): 1 year (life 15 years)

Quality of Components:

Manufactured in EU.

All components in the kit are high quality with 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.
- Aluminium 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 stored in to batteries and also 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, battery bank is at low level and there is instability in the grid supply network. In these situations the customer consumes energy from diesel generator.
3. Battery bank can be increased according to the requirement of autonomy time.

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

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

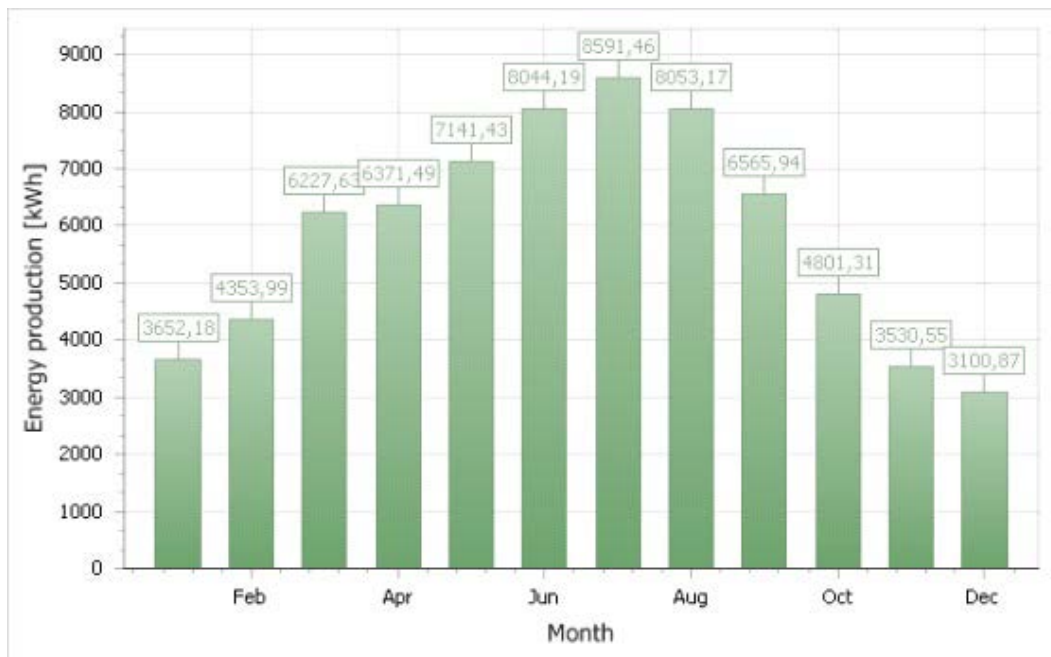
Operation and maintenance services offered for the valued customers for efficient operation of the system. Customers may ask for O&M service contract with the company.

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.

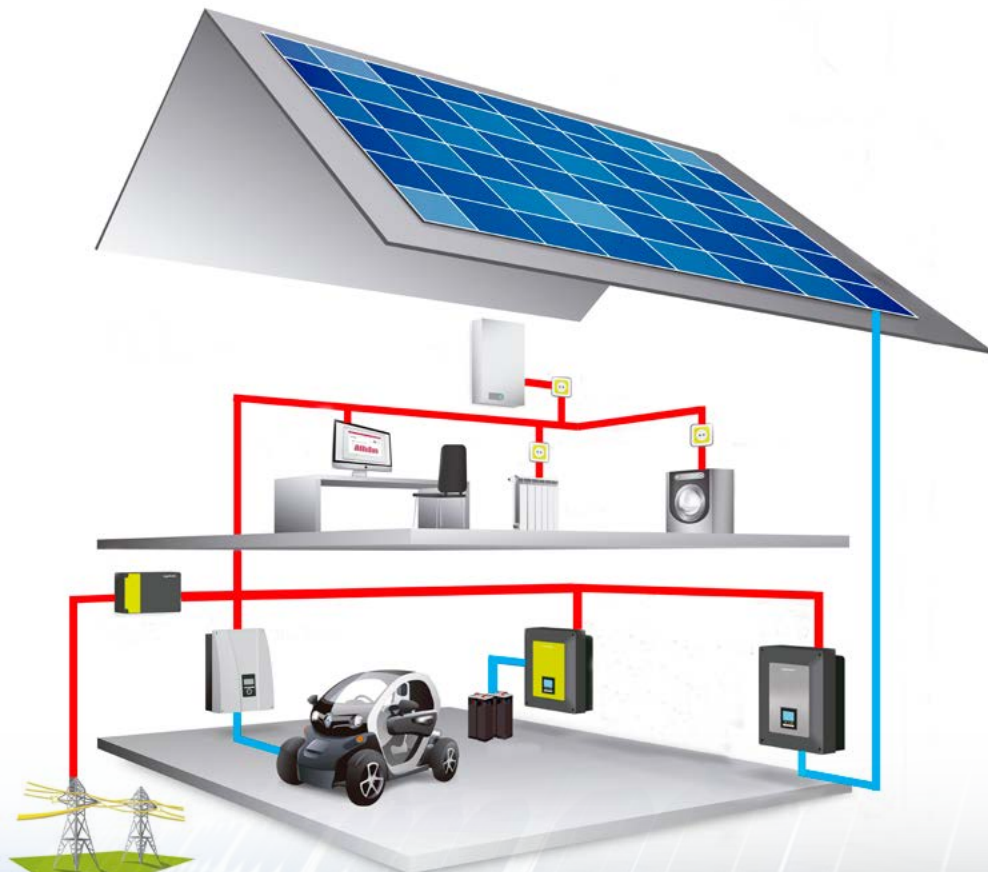
ANNUAL ENERGY PRODUCTION by SOLAR ENERGY KIT MODEL: SEM-CIHAT45K

(Annual global direct irradiation 2,97 kWh/m² in Madrid. Ref: source NASA-SSE)



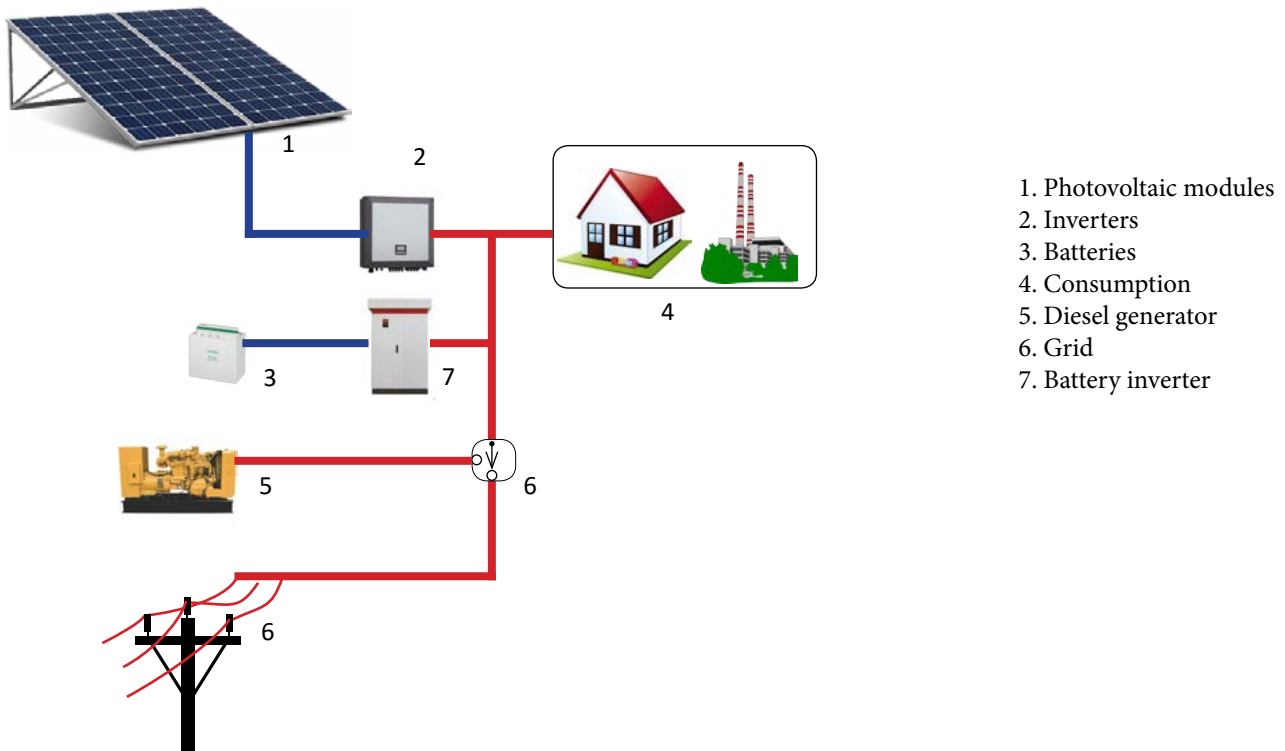
INSTALLATION APPLICATION

- Solar system with batteries and hybrid with external generator (on grid)
- Solar system hybrid with batteries (off grid)
- Solar system with batteries and hybrid with external generator (off grid)



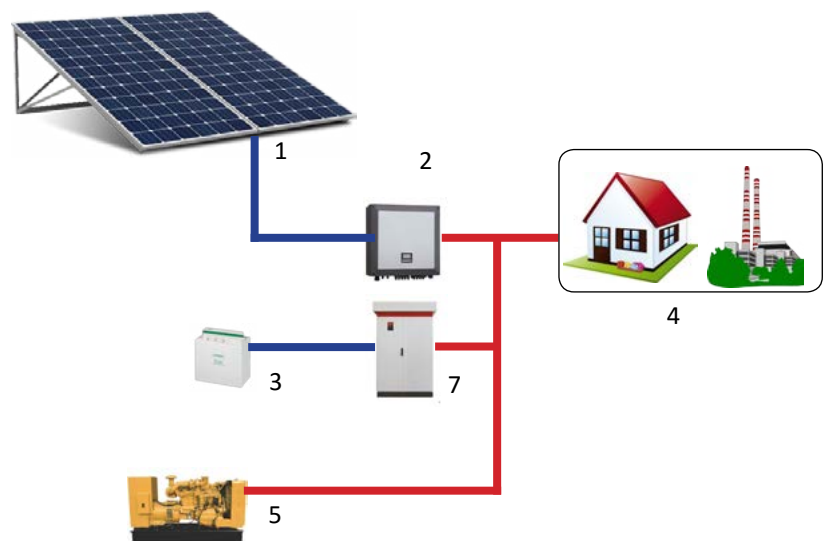
SINGLE LINE ELECTRICAL DIAGRAM

SCHEMATIC DIAGRAM FOR PV PANEL + DIESEL GENERATOR + BATTERY + GRID

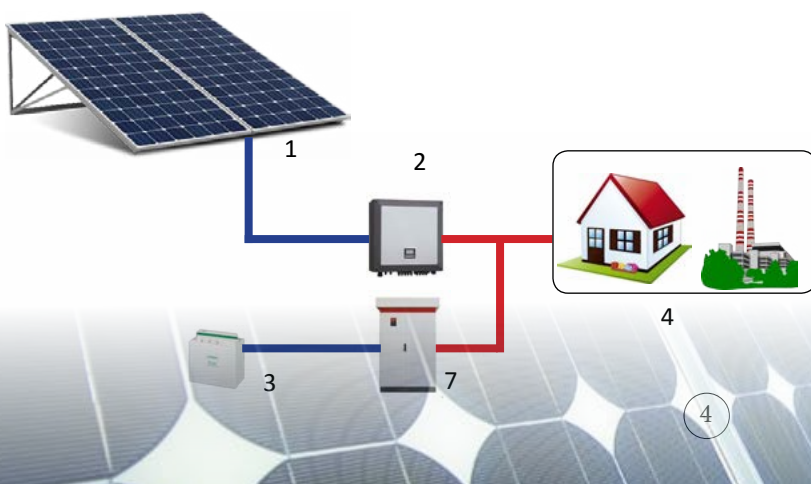


1. Photovoltaic modules
2. Inverters
3. Batteries
4. Consumption
5. Diesel generator
6. Grid
7. Battery inverter

SCHEMATIC DIAGRAM FOR PV PANEL + DIESEL GENERATOR + BATTERY



SCHEMATIC DIAGRAM FOR PV PANEL + BATTERY



POLYCRYSTALLINE SOLAR PANEL 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-60P250
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 3 PLAY 20 TL M

The SUN 3Play 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 98,5% 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 10 up to 33 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 3Play inverters feature have been designed to obtain the 3P 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

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

PV INVERTER TECHNICAL SPECIFICATION

Input (DC)

Recommended PV array power range(1)	20.6 - 26.8 kW
Voltage range MPP	560 - 820 V
Min. voltage for P _{nom} at rated V _{ac}	560 V
Maximum voltage(2)	1,000 V
Maximum current(3)	37 A
Inputs for the S and S+ versions	1
Inputs for the P and P+ versions(4)	5
MPPT	1

Output (AC)

Rated power	20 kW
Max. temperature at rated power(5)	55 °C
Maximum current	29 A
Rated voltage	400 V
Voltage range	277 - 528 V
Frecuency	50 / 60 Hz
Phi Cosine(6)	1
Phi Cosine adjustable	Yes. S _{max} =20 kVA
THD	<3%
Efficiency	
Maximum efficiency	98.5%
Euroefficiency	98.3%

General Information

Refrigeration system	Forced ventilation
Air flow	200 m ³ /h
Stand-by consumption(7)	10 W
Consumption at night	1 W
Ambient temperature	-25 °C to 65 °C
Relative humidity (non-condensing)	0 - 95%
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(8), 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 'V_{oc}' 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_{out}>25% of the rated power (7) Consumption from PV field (8) Related only to inverters up to 16 A.

SUN STORAGE POWER 60 kW

SUN STORAGE Power battery inverter is a three-phase, two way unit that can either be used in off-grid systems or connected to the general supply network. This inverter offers a high power density in a single power block, providing a choice of configurable operating modes.

Battery management

The SUN STORAGE Power features high-tech battery management in order to maximise the useful life of the storage system. The battery temperature can be monitored at all times, guaranteeing a correct operation.

Back-up genset

Furthermore, the SUN STORAGE Power permits the connection of a back-up generator, should this be necessary. It is possible to startup the inverter by using the genset, in order to charge the batteries.

Operating modes:

Stand-alone mode

The SUN STORAGE Power generates a stand-alone AC grid and acts as a grid manager, guaranteeing the correct balance between generation, consumption and the storage system. To achieve this, the SUN STORAGE Power is able to control the energy flows between the grid and the batteries, based on the status at any given time. The SUN STORAGE Power inverter allows a solar energy source to be integrated into the grid, through the use of SUN inverters.



Back-up mode

This operating mode has been designed for grid-connected systems, where grid outages are long and frequent, meaning that a back-up power source is required. The SUN STORAGE Power inverter operates through a connection to the AC grid. In order to guarantee a power source, the inverter maintains the batteries charged. During a grid outage, the battery inverter generates the AC network and the energy stored in the batteries is used to power the loads. If any renewable energy sources are connected to the grid and the energy generated is greater than that demanded, then the surplus could be injected into the grid. Furthermore, this mode also makes it possible to implement peak shaving strategies, in order to shave consumption peaks and reduce the contracted power.

Self-consumption mode

This operating mode is conceived for grid-connected systems with renewable energy sources, in order to minimise grid consumption. If the energy generated is greater than demand, then any surplus energy could charge the batteries or, if they are fully charged, the energy could be injected into the grid. If the loads demand more energy than that produced by the renewable sources, then the batteries would cover this demand, increasing the self-consumption ratio. This mode also allows for the implementation of peak shaving strategies in order to shave consumption peaks and lower the electricity bill.

PROTECTIONS:

- Galvanic isolation between the DC, and AC sides.
- Short-circuits and overloads at the output.
- Insulation faults.
- DC switch.
- AC circuit breaker.

BATTERY INVERTER TECHNICAL SPECIFICATION

Batteries (DC)

Nominal power	≥ 62 kW
Voltage range	330 - 820 V
Minimum voltage ⁽¹⁾	1,000 V
Maximum current	191 A
Inputs	4
Type of battery	Lead, Ni-Cd, Li-ion

Input (AC)

Rated voltage	400 V
Voltage range	320-480 V
Frequency	50 / 60 Hz
Frequency range	40 -70 Hz
Charging current range	0 - 96 A
Maximum power	250 kW

Output (AC)

Rated power ⁽²⁾	60 kW
Maximum current	96 A
Rated voltage	400 V
Frequency	50 / 60 Hz

Efficiency

Maximum efficiency	96.4%
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General Information

Galvanic isolation	Yes
Air flow	2600 m ³ /h
Stand-by consumption	30 W
Ambient temperature	-20 °C to +65 °C
Relative humidity (non-condensing)	0 - 95%
Maximum altitude ⁽³⁾	3000
Protection class	IP20
Weight	900 kg

Compliance with standards:	EN 61000-6-1, EN 61000-6-2, EN 61000-6-4, EN 61000-3-12, EN 61000-3-11, EN 62109-1, EN 62109-2, IEC 62103, EN 50178, FCC Part 15, EN 50438, IEC 62116, IEC 61727, VDE 0126-1-1
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- Notes: (1) Above 820 V, the maximum current decreases gradually
(2) AC Power for 40 °C ambient temperature
(3) Over 1,000 m temperature for rated power is reduced at the rate of 4.5 °C for each 1,000 m.

ACCESSORIES SUPPLIED AS STANDARD:

- RS-485 communication.
- CAN communication for smart batteries.
- Configurable potential free inputs.
- Configurable potential-free outputs, some for the connection and disconnection of a back-up genset
- DC pre-charge system.
- Type 2, AC surge arresters.

SOLAR BATTERY POWER.COM AGM (GEL-ESS TECHNOLOGY)

HOPPECKE power.com SB batteries are based on using flat plate technology and fixing the electrolyte inside glass mats (AGM) which even take the separating function. The high energy density of HOPPECKE power.com SB batteries causes small footprint and a very good use of space. The central degassing integrated in the battery lid can, by using optional tubes, be used to carry out all occurring gases. The flat lid with integrated handle and the easy to clean surface guaranty an easy and comfortable handling by assembly as well as in operation. Optional this battery even can be delivered for horizontal assembly.

This characteristic of HOPPECKE power.com SB batteries makes HOPPECKE power.com SB batteries usable in a wide applications spectrum. Mostly HOPPECKE power.com SB batteries are used in emergency current-, IT/ Telecom- and safety light applications.

HOPPECKE power.com SB batteries offer a design life from more then 12 years and are classified as “Long Life” following EUROBAT.

Your benefits with HOPPECKE power.com SB

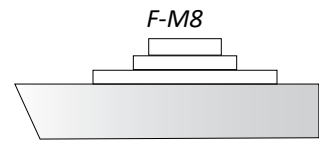
- Maintenance-free regarding water refilling - Due to innovative GEL-ESS technology
- Good high-current capability
- Low investment costs due to innovative electrode structure
- Optimal space utilization - due to horizontal arrangement
- Optimum operational safety
- Integrated backfire protection and central degassing system
- Higher short-circuit safety even during the installation - Based on HOPPECKE system connectors
- Easy assembly and installation - battery lid with integral handle



Battery

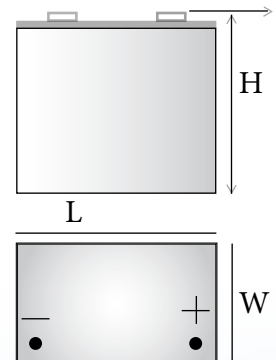
Type of Battery:

Standards:	power.com SB IEC 60896, IEC 61427, DIN 40744
Capacity Range:	50-600 AH
Normal Voltage range:	12V/6V/2V
Container Material:	PP, talcum
Grid alloy (+ive, -ive)	Pb + <1% Ca
Plates (+ive, -ive)	Tubular, Grid
Electrolyte:	H ₂ SO ₄ , AGM
Application:	Solar
Connector design:	bolted connector
Design life up to	15 years
Cycles up to @ 30% DoD:	1.000
Operating temperature:	-20°C to +40°C



20 Nm
Connector type

Voltage	Capacity	Weight	Size (L X W X H)
12 V	70 AH	40 Kg	272 X 206 X 283
12 V	120 AH	52.5 Kg	272 X 206 X 283
12 V	180 AH	75.5 Kg	380 X 206 X 383
6 V	250 AH	51 Kg	272 X 205 X 383
6 V	300 AH	66 Kg	380 X 206 X 383
6 V	370 AH	73 Kg	380 X 205 X 383



SOLAR BATTERY BLOC OPzV SOLAR POWER GEL

The OPzV bloc solar.power batteries are sealed stationary batteries with fixed electrolyte in gel. The construction as sealed batteries makes OPzV bloc solar.power batteries maintenance free relating to re-filling of water.

Using tubular plates in combination with gauntlets at their positive tubular plates, OPzV bloc solar.power batteries offer an extreme high cycling expectancy. So they are optimal for application in sectors with high charge and discharge operation load like solar and off-grid applications. The electrolyte of OPzV bloc solar.power batteries is fixed in gel what causes even the option of a horizontal assembly (optional).

The shock resistant and strengthened Polypropylene housing offers an easy to clean surface and is resistant against all established cleaners. The flat lid with its integrated handle guaranties a very good handling and an easy assembly

HOPPECKE batteries of the OPzV bloc solar.power type series have a cycling expectancy from up to 4500 discharges with 30% discharge level.

Your benefits with OPzV bloc solar.power batteries

- **Maximum cycle stability and durability** in particular during PSoC operations
- **Minimum maintenance costs with maximum safety** maintenance-free² due to sealed Gel-technology
- **Highest reliability** for remote off-grid applications
- **High resistance against mechanical stress** reinforced impact-proof polypropylene housing
- **Highest project flexibility** provided by excellent stocking capability
- **Optimal environmental compatibility** - Closed loop for recovery of materials in an accredited recycling system

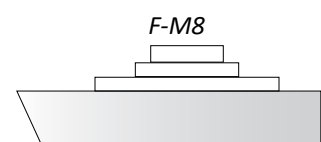


Battery

Type of Battery:

Standards:	IEC 60896, IEC 61427, DIN 40744
Capacity Range:	70-370 AH
Normal Voltage range:	12V/6V
Container Material:	PP, talcum
Grid alloy (+ive, -ive)	Pb + <1% Ca
Plates (+ive, -ive)	Tubular, Grid
Electrolyte:	H ₂ SO ₄ , GEL
Application:	Solar
Connector design:	bolted connector
Design life up to	10 years
Cycles up to @ 30% DoD:	1.300
Operating temperature:	-20°C to +40°C

OPzV bloc solar.power

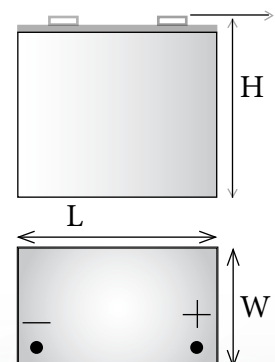


F-M8

20 Nm

Connector type

Voltage	Capacity	Weight	Size (L X W X H)
12 V	50 AH	26 Kg	229 X 177 X 230
12 V	60 AH	26.5 Kg	229 X 177 X 230
12 V	80 AH	37.5 Kg	344 X 177 X 230
12 V	100 AH	38 Kg	344 X 177 X 230
12 V	110 AH	52 Kg	498 X 177 X 230
12 V	130 AH	52.5 Kg	498 X 177 X 230
12 V	140 AH	54.5 Kg	242 X 170 X 275



KIT COMPONENTS

Design

Technical feature

Weight

Loads

Test certificate

Modular type

Aluminium

10 years warranty

Tamper proof nut bolt

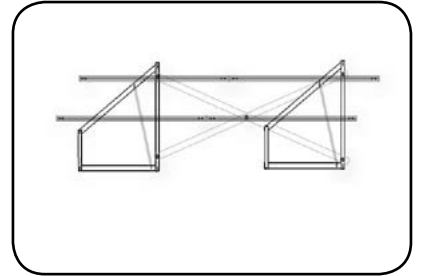
100% recyclable material

A2 Stainless steel bolts

2,49kg/m

wind, snow

CE Certifies



Support structure

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



Cable with connector

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



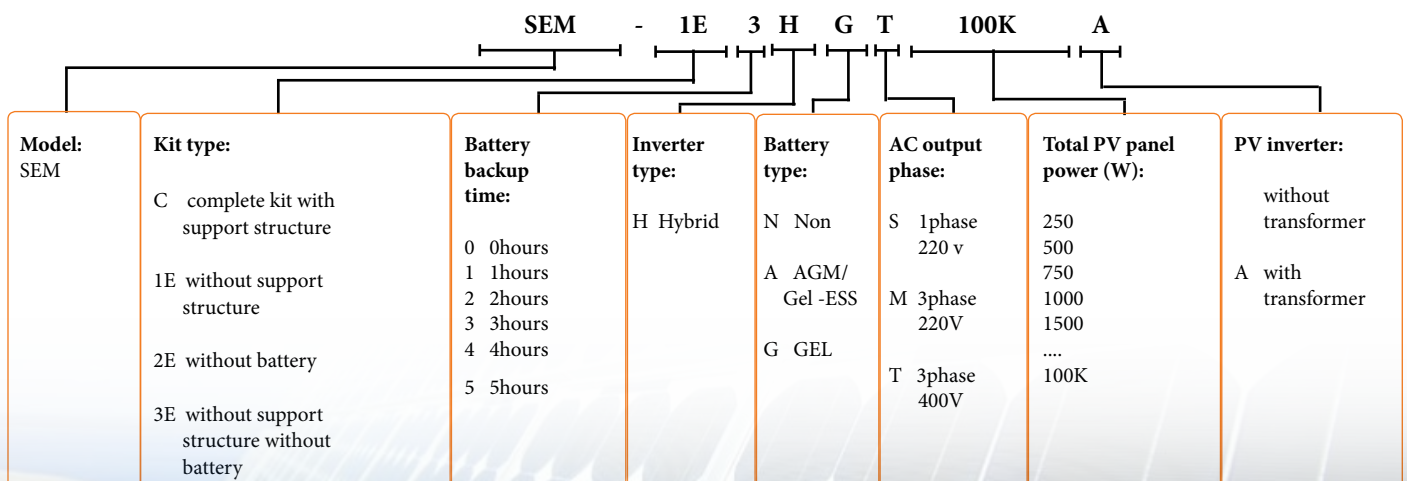
Cable connector MC4

45KW SOLAR ENERGY HYBRID KITS

Complete systems including all accessories with following options

REF#	MODEL#	Option details:
19029	SEM-3E0HNT45K	-without battery and without aluminium support structure
19129	SEM-2E0HNT45K	-without batteries
19229	SEM-1E1HAT45K	-AGM (GEL-ESS) battery backup 1 hour and without aluminium support structure
19329	SEM-1E2HAT45K	-AGM (GEL-ESS) battery backup 2 hours and without aluminium support structure
19429	SEM-1E3HAT45K	-AGM (GEL-ESS) battery backup 3 hours and without aluminium support structure
19529	SEM-1E4HAT45K	-AGM (GEL-ESS) battery backup 4 hours and without aluminium support structure
19629	SEM-1E5HAT45K	-AGM (GEL-ESS) battery backup 5 hours and without aluminium support structure
19729	SEM-1E1HGT45K	-GEL battery backup 1 hour and without aluminium support structure
19829	SEM-1E2HGT45K	-GEL battery backup 2 hours and without aluminium support structure
19929	SEM-1E3HGT45K	-GEL battery backup 3 hours and without aluminium support structure
20029	SEM-1E4HGT45K	-GEL battery backup 4 hours and without aluminium support structure
20129	SEM-1E5HGT45K	-GEL battery backup 5 hours and without aluminium support structure
20229	SEM-C1HAT45K	-AGM (GEL-ESS) battery backup 1 hour
20329	SEM-C2HAT45K	-AGM (GEL-ESS) battery backup 2 hours
20429	SEM-C3HAT45K	-AGM (GEL-ESS) battery backup 3 hours
20529	SEM-C4HAT45K	-AGM (GEL-ESS) battery backup 4 hours
20629	SEM-C5HAT45K	-AGM (GEL-ESS) battery backup 5 hours
20729	SEM-C1HGT45K	-GEL battery backup 1 hour
20829	SEM-C2HGT45K	-GEL battery backup 2 hours
20929	SEM-C3HGT45K	-GEL battery backup 3 hours
21029	SEM-C4HGT45K	-GEL battery backup 4 hours
21129	SEM-C5HGT45K	-GEL battery backup 5 hours

Solar Energy Kit Model Configuration:



Your contribution to reduce CO₂ for sustainable earth



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