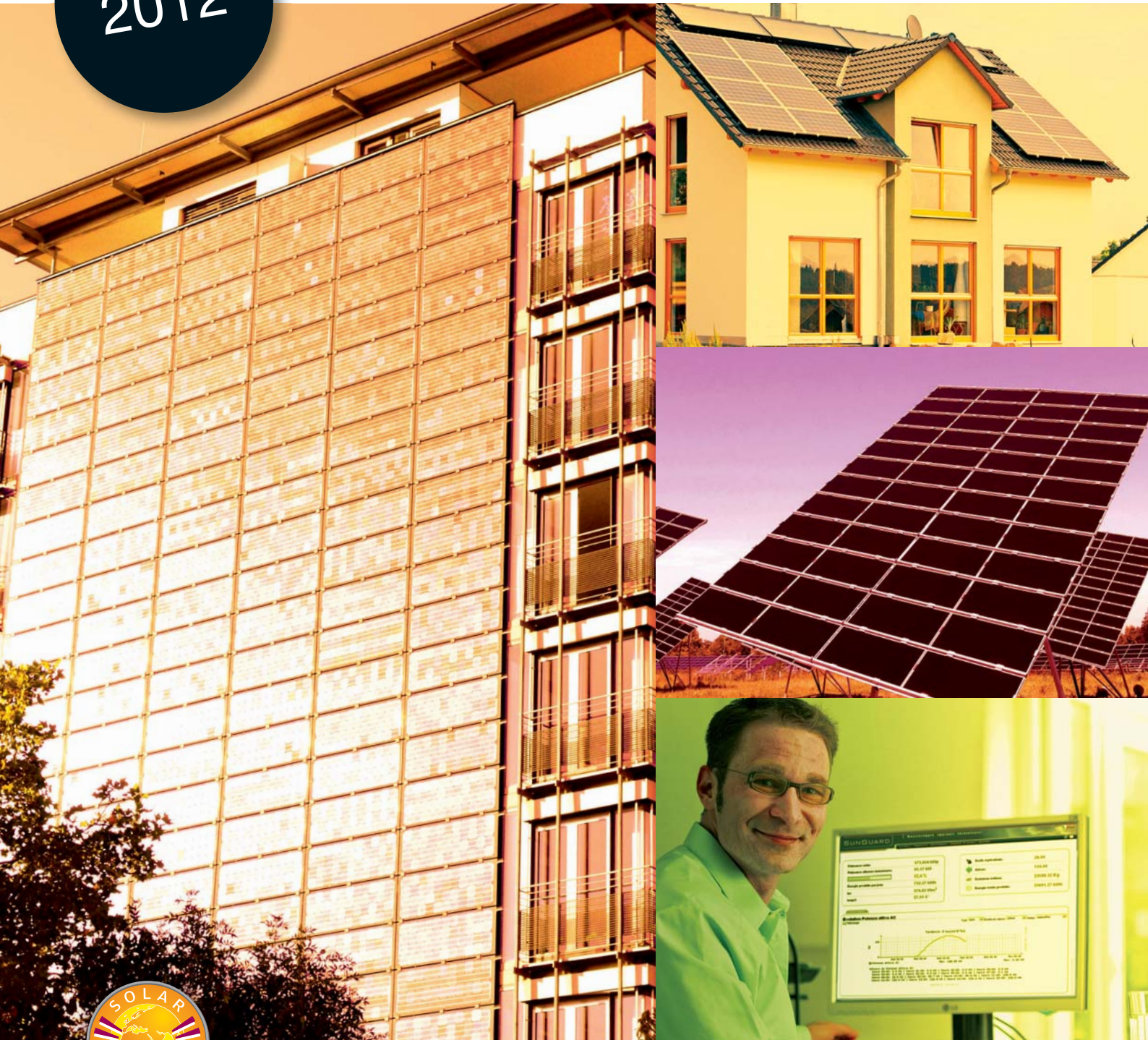


# Photovoltaic solutions

2012

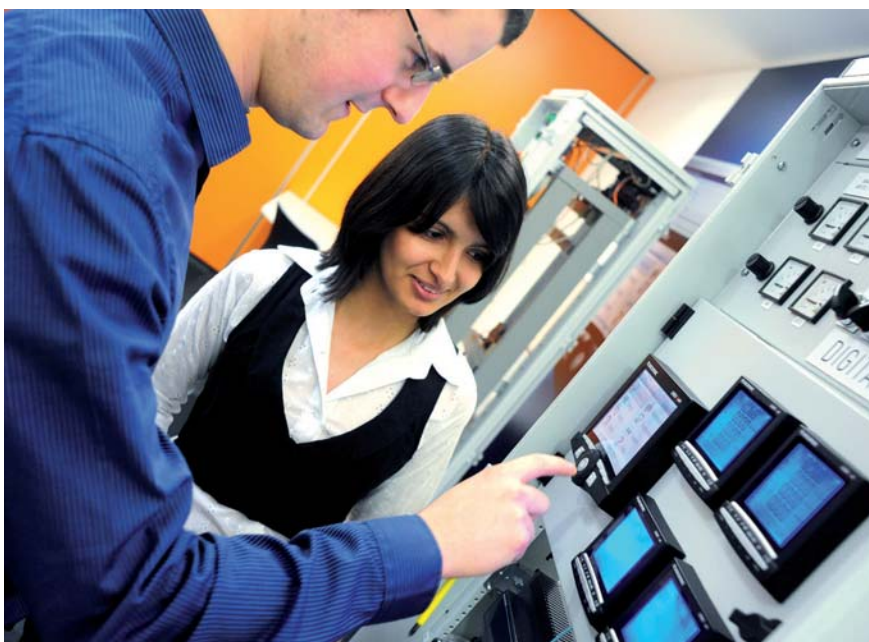




# SOCOMEC: an independent manufacturer

## the benefit of a specialist

Founded in 1922, SOCOMEC is an industrial group with a workforce of 3000 people. Our core business - the availability, control and safety of low voltage electrical networks with increased focus on our customers' power performance.



### The culture of independence

The SOCOMEC Group's independence ensures control over its own decision-making, respecting the values advocated by its own family shareholders and shared by its employees.

With around 30 subsidiaries located on all five continents, SOCOMEC pursues international development by targeting industrial and service applications where the quality of its expertise makes all the difference.

### The spirit of innovation

As undisputed specialists in UPS systems, mains supply changeover, power conversion and measurement, SOCOMEC dedicates nearly 10% of its turnover to R&D. As a result the Group can achieve its ambition of always being one technological step ahead.

### The vision of a specialist

As a manufacturer with complete control over its technological processes, SOCOMEC is quite unlike the more general providers. The Group is constantly improving its fields of expertise in order to offer its clients increasingly customised, appropriate solutions.

### A flexible manufacturing structure

Backed by two European centres of excellence (France and Italy), the Group also benefits from competitive production sites such as Tunisia and locations in the major emerging markets (India and China).

These sites have all implemented a system of continuous improvement based on Lean Management principles, and are therefore in a position to provide high levels of quality, and meet the deadlines and cost requirements expected by customers.

### The focus on service

Our manufacturer's expertise naturally extends to a complete range of services designed to facilitate the research, implementation and operation of our solutions. Our service teams have built their reputation on reassuring guidance, flexible skills and reactivity.

### Responsible growth

As a Group which is open to all cultures and firmly committed to human values, SOCOMEC promotes employee initiative and commitment. Working relationships are based on the idea of partnerships and respect for shared ethics. Through the company's commitment to achieving harmonious, lasting development, SOCOMEC fully embraces its responsibilities not only towards its shareholders, employees, customers and partners, but also towards society as a whole and its environment.

SOCOMEK has been a signatory to the Global Compact since 2003.



# For a high quality power supply

## innovative power solutions

The SOCOMEC UPS product range covers all needs for a high quality, faultless electrical power supply.

Our UPS, as well as our secure power supplies, static transfer systems, harmonic equalizers, rectifiers and DC/AC and AC/DC converters, comprise the most complete ranges in the world and cover a very wide range of applications for every sector of the market.



008 U RANGE

### A key requirement

High quality energy supply at any moment is vital in many fields such as IT, industry and infrastructure applications. It is even mission-critical for many medical applications. SOCOMEC UPS has over 40 years of experience at your disposal.

### Product solutions that meet requirements

Underpinned by significant R&D resources, our product offer continually evolves as a consequence of our contact with customers. To ensure the highest availability, we provide the latest UPS technology combined either with traditional batteries or with other innovative energy storage systems.

Our solutions have the approval of some of the most stringently demanding users: Telecom companies worldwide, Ministries of Defence, nuclear industry operators...

### Recognised expertise

Prestigious accolades have been presented in recognition of the company's ability to meet the needs and product demands of its customers. Among others:

- customer Service Excellence (2004),
- product Innovation (2006),
- best Practice Award for "European Energy & Power Systems Product Line Strategy" (2009),
- European UPS new product innovation award (2011).



### Always focused on customer needs

Our sales and after-sales network means we are always there for you. Our partner-customers recognise the quality of our products, availability and flexibility in meeting requirements and commitment.

### Continuing innovation

The facts speak for themselves:

- first French manufacturer to offer static power supplies (1968),
- first UPS designed with PWM technology (1980),
- first UPS range in the world using IGBT technology (1990),
- first modular, scalable and redundant UPS system (2000),
- first to integrate hybrid components (2001),
- first 200 kVA UPS with IGBT rectifier (2003),
- new battery charging design (2004),
- dynamic energy storage system (flywheel) (2006),
- first UPS with 96% efficiency in true online double conversion mode (2007),
- most compact STS 19" rack hot-swappable (2009),
- most compact 900 kVA UPS (2010),
- first complete UPS range (10-2400 kVA) with 3-level technology, 96% efficiency and power factor 1 (2012).



SOCOMEK joined the United Nations "Global Compact" in 2003 to tackle the social and environmental challenge of globalization.

**ISO 14001** This international standard



recognizes SOCOMEC's determination on pursuing its commitment to preserve the environment.



**The Green Grid™** is an organization committed to improving the resource efficiency of data centres and business computing ecosystems.

As Endorser on the **European Code of**



**Conduct** for Data Centres, SOCOMEC UPS is committed to implementing energy efficient solutions in new data centres whilst respecting the life cycle, cost effectiveness and the performance availability of the system.

# Renewed energy

## continuous performance

SOCOMEK solutions have earned the company an indisputable reputation for control, safety and low-voltage energy conversion. And, naturally, our experience extends to offering standard and personalised solutions to the efficiency and continuity needs of photovoltaic solar systems.

### For systems of all sizes

From a single house to a big photovoltaic park through the factories roof, the SOCOMEK SOLAR product range covers the entire spectrum of photovoltaic system power generation.

### Compliant instruments for R&D

SOCOMEK centres of expertise have two state of the art test centres: one in France, accredited by Cofrac for equipment testing, and one in Italy with a 190 kW photovoltaic plant. These power plants enable R&D to validate developed technologies and proposed solutions.

### SOCOMEK style

Quality products, attentive listening, adaptability to needs and commitment to the client: all aspects for which our clients and partners recognise a particular "SOCOMEK style" that we offer to designers, integrators and managers of a sector of application focused on "positive energy!"



### Essential know-how

Clients looking to update their power supply systems while integrating photovoltaic solar energy production need to consider the energy conversion produced by the photovoltaic panels and the connection of the systems to the power grid.

Given the specific nature of the system and the electrical parameters in play, specific know-how is required to ensure the optimum performance and long-life of the system.

### Controlled expertise

A cutting edge centre of expertise of the Socomec Group, SOCOMEK SOLAR has all the expertise needed to ensure full control over the main generic functions of a photovoltaic system. In addition to providing the panels, our solution covers DC protection and connection, DC/AC conversion, AC protection and connection and power generation system supervision. SOCOMEK SOLAR has created and regularly updates a Technical Journal, a reference publication dedicated entirely to photovoltaic systems.



- > Solar inverters
- > Switching and isolation
- > Overcurrent and overvoltage protection
- > Prevention of DC isolation loss
- > Supervision



120 F RANGE



# SOCOMECSolar: well designed systems

for optimum use

Photovoltaic energy is a dynamic market that offers interesting prospects for the coming years, with the growth of renewable energies proving an essential starting point for a policy of sustainable development. A photovoltaic system is a long-term investment that will provide optimum performance, but it is important to seek expert advice to ensure you get the best performance, safety and duration from your system.

## Major applications

Solar energy has always been a natural and renewable alternative energy source. It just needs to be harvested and converted.

We have known about and used the principles of photovoltaic energy for some time, everywhere from solar calculators to space industry applications. But only recently has the industry been effectively developed thanks to rapid technological progress, allowing us to use this energy source as a genuine alternative to a country's energy mix.

Photovoltaic energy is one of the numerous solutions to the energy challenges of the 21<sup>st</sup> century. Today, different panel and conversion technologies allow us to choose the right solutions for each application. Whatever the application - residential, office, solar park - SOCOMECSOLAR can offer you advice to guarantee you an optimised solution and an efficient use of components.

## Residential applications

Photovoltaic panels can be installed on the roof of a single room or a housing complex. A residential system generally has a peak power of between 2 and 6 kWp in a 230V single-phase AC output voltage.



SITE 409 A

## Building applications

The outdoor surfaces (roof, terrace, facade, etc.) of an industrial building, shopping centre or even a public building can be used to install groups of photovoltaic panels covering a surface area which can range from tens to hundreds of square metres. This type of setup has a peak output power of up to 1 MWp. The alternating current produced is injected into either a low-voltage (230 V single-phase or three-phase) or a medium-voltage (through a transformer unit) power grid.



BODY 283 A

## Solar park applications

Generally occupying a large area of land, photovoltaic parks can be used to install groups of photovoltaic panels covering several thousand square metres. These systems have a peak output power of dozens of MWp and they use large-scale equipment to optimise the quantity of power sent to the grid. The alternating current produced is generally injected to a medium- or high-voltage power grid through a transformer unit.









SITE 317 A

# Inverters

for residential properties and buildings

## Sunsys residential/Sunsys building


						
	H30i	H50	B10	B15	B20	B30
<b>DC INPUT SPECIFICATIONS</b>						
Maximum voltage range	150 - 630 V	200 - 1000 V	250 - 1000 V	200 - 1000 V	200 - 1000 V	200 - 1000 V
Optimum voltage range	260 - 500 V	310 - 820 V	350 - 850 V	350 - 800 V	350 - 800 V	520 - 800 V
Maximum input current	12 A	17 A	16 A x 2	25 A x 2	32 A x 2	32 A x 2
Number of MPPT	1	1	2	2	2	2
<b>AC OUTPUT SPECIFICATIONS</b>						
Nominal power	3.0 kW	5.0 kW	10 kW	15 kW	20 kW	30 kW
Maximum power	3.3 kW	5.25 kW	10 kW	16 kW	21 kW	33 kW
Output voltage	230 V	230 V	400 V 3Ph+N	400 V 3Ph+N	400 V 3Ph+N	400 V 3Ph+N
Maximum efficiency	97,0%	97,8%	97,9%	98,1%	98,1%	98,1%
European efficiency	96,5%	97,2%	97,1%	97,6%	97,6%	97,6%
Current distortion	< 5%	< 5%	< 3%	< 3%	< 3%	< 3%
Nominal output frequency	50 Hz	50 Hz	50 Hz	50 Hz	50 Hz	50 Hz
<b>GENERAL SPECIFICATIONS</b>						
Dimensions L x D x H (mm)	350 x 205 x 1000*	470 x 159 x 530	548 x 275 x 644	610 x 287,5 x 965	610 x 287,5 x 965	610 x 287,5 x 965
Weight (kg)	21	23	46	63	65	70
Operating temperature	-20/+60 °C	-20/+60 °C	-20/+60 °C	-20/+60 °C	-20/+60 °C	-20/+60 °C
Degree of protection	IP65	IP65	IP65	IP65	IP65	IP65
Galvanic isolation	transformerless	transformerless	transformerless	transformerless	transformerless	transformerless
Cooling	natural convection	natural convection	smart cooling	smart cooling	smart cooling	smart cooling
<b>STANDARDS</b>						
Norms and standards	CEI 0-21 VDE-AR-N4105 VDE 0126-1-1	CEI 0-21 VDE-AR-N4105 VDE 0126-1-1	CEI 0-21 VDE-AR-N4105 VDE 0126-1-1	CEI 0-21 VDE-AR-N4105 VDE 0126-1-1	CEI 0-21 VDE-AR-N4105 VDE 0126-1-1	CEI 0-21 VDE-AR-N4105 VDE 0126-1-1
CE conformity	yes	yes	yes	yes	yes	yes

\*Easy Connection Box included

# Inverters

for solar parks

## Sunsys park

						
	P33	P66	P100	P133*	P166*	P200*
<b>DC INPUT SPECIFICATIONS</b>						
Maximum voltage range	350 - 900 V					
Optimum voltage range	450 - 850 V					
Maximum input current	80 A	160 A	240 A	320 A	400 A	480 A
Number of MPPT	1	1 to 2	1 to 3	1 to 4	1 to 5	1 to 6
<b>AC OUTPUT SPECIFICATIONS</b>						
Nominal power	33 kW	66 kW	100 kW	133 kW	166 kW	200 kW
Maximum power	36 kW	73 kW	110 kW	146 kW	183 kW	220 kW
Output voltage	280 V					
Maximum efficiency	97,6 %					
European efficiency	97,3 %					
Current distortion	< 3 %					
Nominal output frequency	50 Hz					
<b>GENERAL SPECIFICATIONS</b>						
Dimensions L x D x H (mm)	600 x 800 x 1400			800 x 800 x 2150		
Weight (kg)	120	155	190	320	355	390
Operating temperature	-5/+55 °C					
Degree of protection	IP20					
Galvanic isolation	transformerless					
Cooling	smart cooling					
<b>STANDARDS</b>						
Norms and standards	CEI 0-21, VDE-AR-N4105, VDE 0126-1-1					
CE conformity	yes					

\* Product under development (preliminary technical data).



APPUL 435 A

# SUNSYS P1000

the best complete and coordinated solution for photovoltaic parks

The P1000 station is built using 100% Socomec components and can be combined with the Socomec intelligent field box (IFB) range which, paired with SUNGUARD monitoring system, make the P1000 a complete solution with guaranteed performance and safety for the entire life of the system.



SUNSYS P1000.



SUNSYS P200.

## SUNGUARD

The high-performance monitoring solution

- Maximum simplicity of access (WEB monitoring).
- Comprehensive monitoring potential to give the user maximum peace of mind (inverters, strings, radiation, temperature, wind, alarms...).
- Email, SMS and system report services.



SYDW 102 A

## SUNSYS IFB (Intelligent Field Box)

- Extremely flexible modular solutions adaptable to all types of plants.
- Optional SUNSYS GUARDIAN for protecting panels and inverters from thefts.
- Guaranteed maximum professionalism and safety for all installation environments
  - IP 65 with anti-condensation valves
  - Weather-sealed electronic panels
  - 5.4 kVac isolation
  - Broad temperature range -20/+60 °C
  - EMC grade A (industrial environment) and grade B (domestic environment).

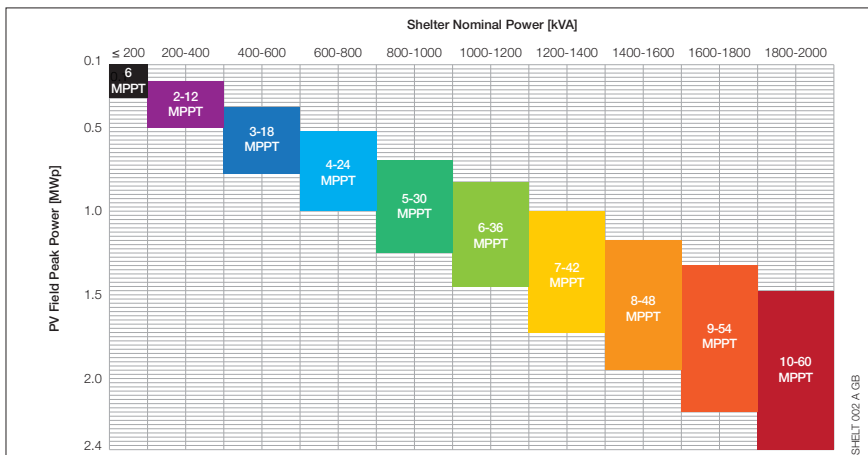
- High level of protection against indirect contact (class II).
- Compliant with standards (IEC 61439-2/ IEC 62109-1/UTE C 15-712-1/Ready for IEC 61010-1).



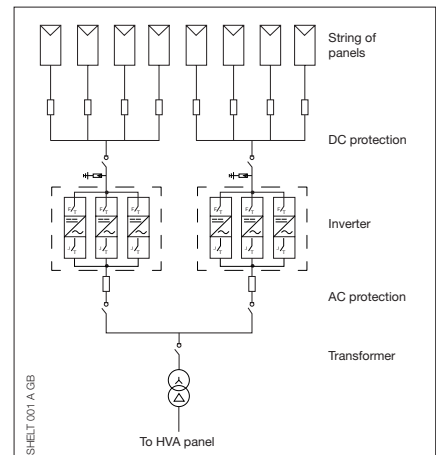
IFB 16 (16-string Intelligent Field Box).

## SUNSYS Shelter

This range is available in various power ratings, up to 2 MW with a low voltage DC input and AC output.



Turnkey power station available in different sizes.



Power station layout installed between DC connections and AC input



# A flexible solution that goes beyond the typical concept of efficiency

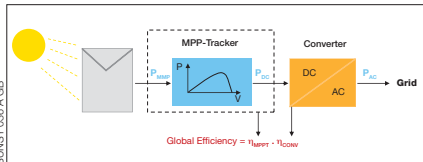
## Maximum overall conversion efficiency (Tot. EFF. = conversion eff. x MPPT eff.)



SUNSYS 042 A

SUNSYS P200 comprises 6 highly innovative conversion modules.

Thanks to its three-level topology and excellent "MPPT EXPERT" algorithm certified by the prestigious Fraunhofer Institute of Freiburg, the P200 conversion module guarantees an overall efficiency of over 98%.



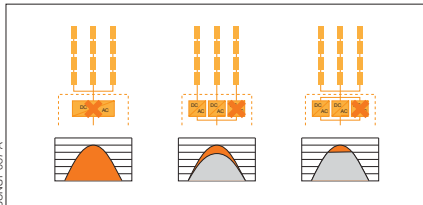
SUNSYS 036 A GB

Overall conversion efficiency.

## Maximum system "availability" and simple maintenance (HOT SWAPPABLE)

The SUNSYS P200's intelligent modular setup extends its life expectancy by up to 50% thanks to its various conversion modules which operate in rotation according to solar radiation.

This also drastically reduces the risk of downtime, with the load being transferred to the other modules in case one is damaged. The modules are also designed to be easily replaceable without stopping production (HOT SWAPPABLE).

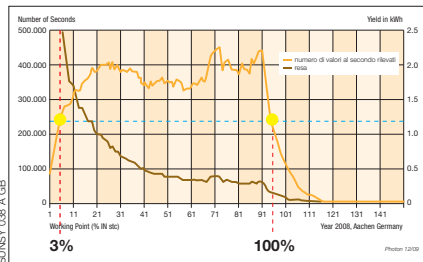


SUNSYS 037 A

Damage impact on various systems (centralised / distributed / modular).

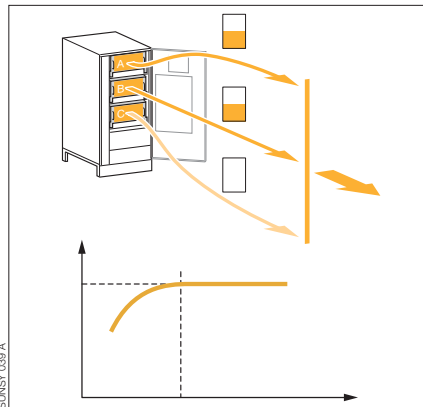
## Maximum output in all radiation conditions thanks to the DPC.

The DPC (Dynamic Power Control) algorithm guarantees maximum conversion efficiency (98%) starting from 3% of the nominal power. For photovoltaic parks that run mostly under conditions of low radiation, this means a considerable increase in the energy produced over the course of a year.



SUNSYS 038 A GB

Annual system yield at various radiation levels.

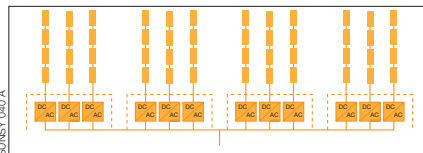


SUNSYS 039 A

Dynamic power control.

## Maximum flexibility

The 5 conversion systems P200 allow the P1000 conversion station to easily adapt to any type of photovoltaic park, with up to 30 different MPPTs that are easily configurable into groups depending on the energy needs, offering unrivalled performance.



SUNSYS 040 A

Multi-MPPT design.

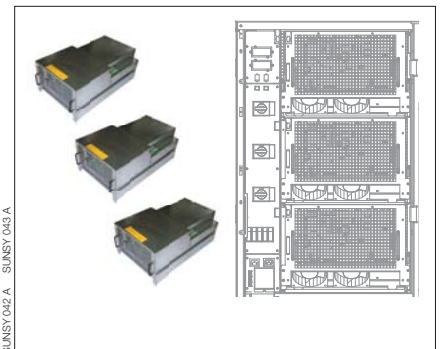
## Maximum production, always

The intelligent modular architecture and DPC algorithm of the SUNSYS P1000 provide the client with all the benefits of both centralised and distributed units in a single solution, ensuring maximum production in all types of parks, with all panel technologies and in all radiation conditions.



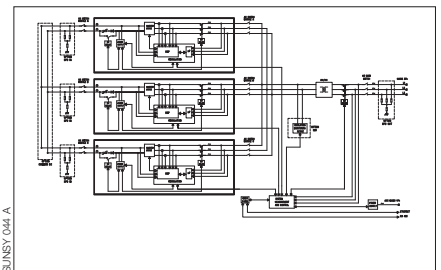
SUNSYS 041 A GB

State of the art modular architecture.



SUNSYS 042 A - SUNSYS 043 A

Efficient and manageable 33 kW power modules.



SUNSYS 044 A

Intelligent modular architecture.

# Energy storage

the future of renewable energy

Socomec presents a new concept of storage solutions with highly innovative characteristics, thanks to over 40 years of experience in energy storage and conversion.

Socomec ES is an innovative solution for maximising renewable energy system output, efficiently integrating it into the existing power grid and into the future world of MICROGRIDS.

The new "Socomec ES" concept covers power ratings that range from KW to MW and can be expanded across multiple units in parallel.

In-line with Socomec's traditional product strategy, the system will be modular, scalable and hot-swappable, with a fully innovative mixed-configuration feature making it compatible with the Socomec photovoltaic

converter and with different battery technologies depending on the applications to be covered.

This cutting-edge feature of full configurability and scalability on 3 levels (PV conversion / Storage conversion / Battery backup) places Socomec on the market as the first developer to introduce a single solution capable of satisfying a wide variety of applications (PV conversion, Dynamic Demand Response, Peak Shaving, Load Shifting, Outage Protection).

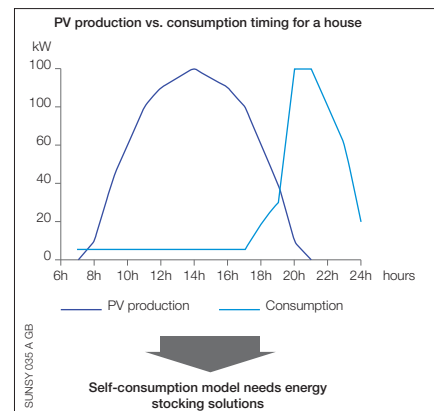
## SUNSYS ESR (Energy Storage Residential)



SUNSYS 052 A

### The solution to maximum residential system output

- A single integrated photovoltaic (PV) conversion and energy storage (ES) solution.
- Energy shifting and peak shaving modes.
- An extremely flexible, scalable and mixable (PV/ES) solution.
  - Plug-in scalable PV conversion modules (3 kW / 4,6 kW)
  - Plug-in battery scalable ES conversion modules (3 kW / 4,6 kW)
  - Scalable plug-in lithium ion battery modules.
- System easy to set up in a mixed configuration (PV + ES).
- Backup time easy to configure thanks to the scalable battery modules.
- Adaptable to any existing PV system.
- High system up-gradability in terms of both power and autonomy.
- Intelligent load management.
- Compatible with the latest standards (CEI 0-21, VDE-AR-N- 4105).



SUNSYS 053 A  
SUNSYS ESR internal view

## SUNSYS ESI (Energy Storage Industrial)



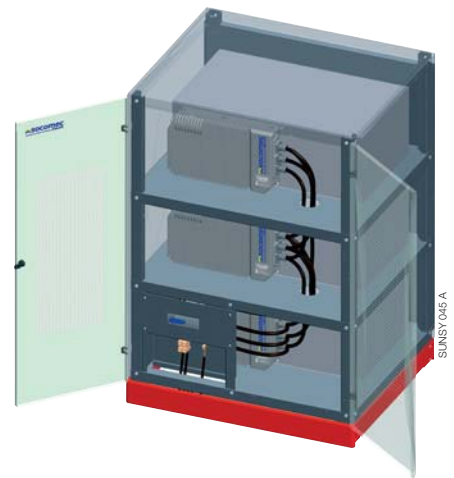
### Solutions for maximising energy management

- A single integrated photovoltaic (PV) conversion and energy storage (ES) solution.
- Energy shifting, peak shaving and grid stabilising (active and reactive power) functions.
- An extremely flexible, scalable and mixable (PV/ES) solution.
  - 33 kW scalable PV conversion modules
  - 33 kW scalable battery ES conversion modules
  - Scalable battery modules.
- Compatible with different battery technologies depending on the application (Pb, Lithium, Na-NiCl).
- System easy to set up in a mixed configuration (PV + ES).
- Backup time easy to configure thanks to the scalable battery modules.
- Adaptable to any existing PV system.
- High system up-gradability in terms of both power and autonomy.
- 98% efficiency.
- Compatible with the latest standards (CEI 0-21, VDE-AR-N 4105).

## SUNSYS SODIUM

### The industrial storage solution with zero environmental impact

- Special cabinet version for industrial applications.
- High energy density.
- Insensitive to temperature.
- Long life cycle.
- Maintenance-free.
- Zero environmental impact.



## SUNSYS LITHIUM



### The high-performance industrial storage solution

- High rapid discharge performance (peak shaving applications).
- High energy density.
- Highly compact.
- Easy scalability.
- Easy to maintain (plug-in).
- Long life cycle.
- Maintenance-free.
- Zero environmental impact.



SUNSYS ESI LITHIUM.



## HEAD OFFICE

### **SOCOMEK GROUP**

S.A. SOCOMEK capital 11 149 200 € - R.C.S. Strasbourg B 548 500 149  
B.P. 60010 - 1, rue de Westhouse - F-67235 Benfeld Cedex

### **SOCOMEK UPS Strasbourg**

11, route de Strasbourg - B.P. 10050 - F-67235 Huttenheim Cedex- FRANCE  
Tel. +33 (0)3 88 57 45 45 - Fax +33 (0)3 88 74 07 90  
admin.ups.fr@socomec.com

### **SOCOMEK UPS Isola Vicentina**

Via Sila, 1/3 - I - 36033 Isola Vicentina (VI) - ITALY  
Tel. +39 0444 598611 - Fax +39 0444 598622  
hr.ups.it@socomec.com

## SALES, MARKETING AND SERVICE MANAGEMENT

### **SOCOMEK SOLAR**

95, rue Pierre Grange  
94132 Fontenay-sous-Bois Cedex  
Tél: 01 45 14 63 04 - Fax: 01 45 14 63 89  
info.solar.europe@socomec.com

## YOUR DISTRIBUTOR

[www.socomec.com](http://www.socomec.com)

Non contractual document. © 2012, Socomec SA. All rights reserved.



**socomec**  
Innovative Power Solutions **SOLAR**