

Photovoltaics

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from the experts



# About us

Centrosolar is one of the most rapidly growing solar companies in Europe. We are a leading supplier of photovoltaic systems for private households and commercial users.

Our range of products includes complete systems (stand alone systems, grid-connected systems as well as building integrated PV systems), modules (crystalline and thin film modules), inverters, mounting systems and solar glass.

We distribute all our products worldwide. A substantial part of our turnover is generated abroad. We have offices in Spain, France, Italy, Greece, Switzerland, the Netherlands, the UK and the USA. Our portfolio of products includes photovoltaic complete systems as well as a choice of components for solar power generation.

Our systems are very efficient and set the benchmark with their impressive technical and aesthetical standards. We at Centrosolar are dedicated to a high level of customer service. A team of highly qualified staff offers support to customers and partners in all areas of PV.

Our technicians put together the individual components of the photovoltaic installation and create complete systems for your individual needs. You only specify the roof dimensions or the desired size of the installation.

We accept the challenge to find a suitable solution and to realize your project together with you. Whether you need an on-roof or an in-roof system, whether you would like to install a PV system on a flat roof or on open land, our modular PV components can always be matched to create your ideal solution.

## 2008

In Wismar we have built a new photovoltaic factory, Sonnenstromfabrik, and at the end of 2008 it was recognized as displaying Europe's most modern PV-Module Production (ISO 9001 and 14001 certified). Here our expert Production team manufactures up to 200 MWp of Centrosolar PV Modules in a year.

## 2006

Integration of Biohaus PV Handels GmbH

## 2005

Integration of Solara AG  
Integration of Solarstocc AG  
Establishment of Centrosolar

## 2004

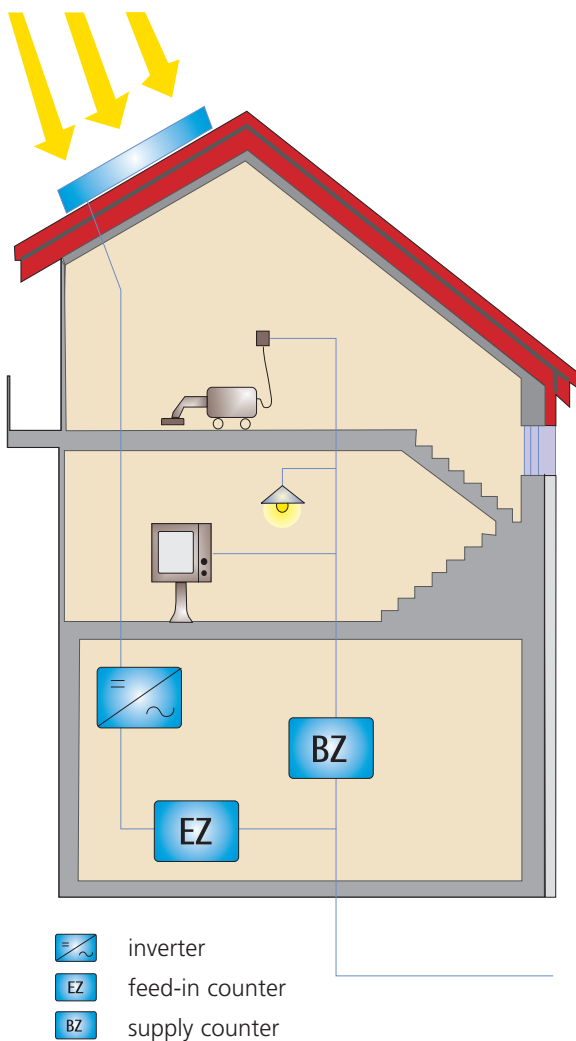
Entrance in the PV-thin film technology (Biohaus)

## 2001

Beginning of the production of solar modules in Wismar (SOLARA Sonnenstromfabrik GmbH)



# What you must know



## A clean and powerful source of energy

Within 20 minutes, the sun radiates as much energy to the earth as the world's total population uses in one year. In the Northern parts of Europe, solar radiation is between 900 and 1200 kWh/m<sup>2</sup>, in Southern Europe values between 1400 and 1700 kWh/m<sup>2</sup> can be reached, in some areas even more. Even with an overcast sky, there is still enough energy that reaches the surface of the earth. This energy is used efficiently by our photovoltaic systems to generate electricity.

## The grid-connected system

90 % of the photovoltaic installations in Germany and many other European countries are grid-connected systems. 100 % of the electricity generated from solar energy is fed into the national grid and sold. When it comes to the planning of such an installation, the usable size of the roof and the financial means are decisive factors for an implementation.

## How much output will your PV system generate per year?

Here the quality and construction of installation components, such as module and inverter, are decisive. The angle of installation and orientation toward the sun are additional important factors for the performance balance of a PV system. On average, the yield per installed kWp in Europe increases from North to South from 750 to 1500 kWh/kWp, in some especially favourable areas even up to 1700 kWh/kWp.

## Installations on open land

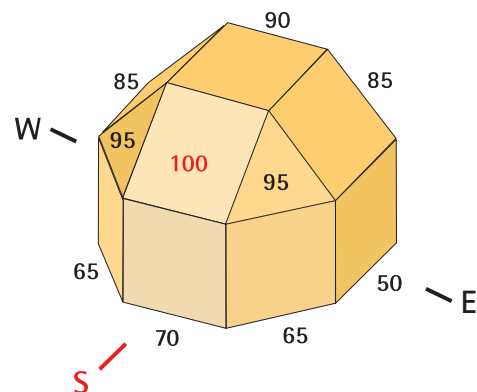
In several countries, installations on open land are the preferred solution. For these systems Centrosolar offers tailor-made solutions. Whether sun tracking systems or central inverters, ask our specialists for the perfect products for your installation on open land.

## Become a power producer with us

A multitude of advantages speak in favour of photovoltaics. Some facts are just convincing:

- Active environmental protection
- Independence from fossile fuels
- Zero-emission electrical generation
- Additional source of income
- Profitable investment

The advantageous employment of renewable energy resources does not only make sense ecologically. Thanks to new regulations for grid-connection and remuneration in many European countries, photovoltaics are already paying off economically. In some countries, even grid-parity seems to be in reach.



The illustration compares the energy output of PV modules on various inclined surfaces of a house.

# Our Complete Systems

We are proud of our efficiency in providing solutions: we deliver an attractive system-package of high-performance modules, intelligent high-quality inverters, innovative system components, consultation and service. Today we are one of the leaders in this area, and, among other things, we offer complete solutions for every performance size and each type of roof.

## Complete System Excellent

For Complete System Excellent only S-Class Excellent modules, reliable, easy-to-handle 54-cell solar panels with a black anodized aluminium frame are used. Furthermore, the complete system includes the mounting system MS Constocc® Excellent which guarantees quick and secure mounting, provides exceptional stability and good rear ventilation for a positive effect on the overall performance. The efficient Powerstocc® Excellent inverters used for this Complete System are available for any number of modules, also un-

ven numbers. The complete system can, against an extra charge, also be combined with the in-roof mounting system MS Intersole or the flat-roof mounting system MS Console Professional and/or inverters by SMA. Our Complete System Excellent comes with a 10 year warranty.

\*Free of charge for standard configuration (MS Constocc® Excellent, Powerstocc® Excellent) only.

## Complete System Professional

For this complete system, only S-Class Professional modules, very reliable, resistant 60-cell solar panels with aluminium frame and antireflective glass are used. The Complete System Professional also includes the MS Ecoline Professional mounting system and a Powerstocc® Excellent inverter. The Complete System Professional can, against an extra charge, also be combined with the in-roof mounting system MS Intersole or the flat-roof mounting system MS Console Professional and/or inverters by SMA.

### Complete System Excellent



### Complete System Professional



# Powerstocc® Excellent Inverters

International environmental and quality standards, such as minimum consumption of raw materials and energy, active environmental protection and efficient utilization of resources, are part of our philosophy.

The environmental and quality management is continuously adjusted to the latest international standards.

The inverter, the heart of the photovoltaic installation, plays an important role here. It is the link between the PV modules (PV generator) and the public electricity grid. By means of the inverter, the DC voltage generated in the modules is converted into the AC voltage conforming to the grid. Inverters have to be adjusted exactly to the efficiency of PV generators.

## PS XX.X Excellent



### Equipment

#### Inverter without transformer

- Integrated 2-row-display
- 3-phase feed-in (except PS 3.0 /3.6)
- Integrated data logger
- Ethernet- und RS485-interface
- Integrated electronic DC-disconnect for the smooth separation of PV-generation field and Inverter
- Control for effective power reduction
- SO input and output

Optional with

- GSM-modem
- Analogue-modem

#### The following types are available:

■ PS 3.0 Excellent	1 MPP Tracker	$P_{nom}$ 2800 W
■ PS 3.6 Excellent	2 MPP Tracker	$P_{nom}$ 3300 W
■ PS 4.2 Excellent	2 MPP Tracker	$P_{nom}$ 3800 W
■ PS 5.5 Excellent	3 MPP Tracker	$P_{nom}$ 5000 W
■ PS 8.3 Excellent	2 MPP Tracker	$P_{nom}$ 7600 W
■ PS 10.1 Excellent	3 MPP Tracker	$P_{nom}$ 9200 W

## PS XXXX Excellent



### Equipment

#### Inverter with transformer

- Integrated 2-row-display
- RS485 interface for data communication
- Integrated DC circuit breaker to separate PV generation field and inverter without difficulty
- Ride through technology

#### The following types are available:

■ PS 1200 Excellent	1 MPP Tracker	$P_{nom}$ 825 W
■ PS 2000 Excellent	1 MPP Tracker	$P_{nom}$ 1650 W
■ PS 3000 Excellent	2 MPP Tracker	$P_{nom}$ 2750 W
■ PS 4000 Excellent	2 MPP Tracker	$P_{nom}$ 3300 W
■ PS 5000 Excellent	3 MPP Tracker	$P_{nom}$ 4000 W
■ PS 6000 Excellent	3 MPP Tracker	$P_{nom}$ 4600 W

# Innovative Mounting Systems

Centrosolar mounting systems guarantee secure, quick and simple assembly of the modules. Whether on-roof, in-roof or on top of a flat roof – with us, you get everything from just one source. All solutions are shaped in such a way that maximum flexibility is also guaranteed during installation.

## Mounting Methods

### On-Roof Mounting

- MS Constocc® Excellent
- MS Ecoline Professional
- MS Constocc® Trapez Excellent

### In-Roof Mounting

- MS Intersole

### Flat Roof Mounting

- MS Console Professional
- MS Constocc® Vario Excellent

## On-roof mounting

On-roof mounting is the most common assembly type in Germany as well as many other countries – is characterized by PV modules mounted on top of the roof cladding, following the inclination of the surface of the roof. Aluminium profiles take up and support the modules, and are attached to special roof hooks that are fastened to the roof substructure. The modules can be arranged vertically as well as horizontally.

## MS Constocc® Excellent

MS Constocc® Excellent has been designed for the professional use. Our engineers developed this outstanding mounting system in cooperation with craftsmen who



have already mounted more than 1,000 photovoltaic installations. The good rear ventilation of the modules has a positive effect on the overall performance. Other special characteristics of the MS Constocc® Excellent are: The quick and easy assembly, the superior design, the excellent stability (Cross connection) and the above-average longevity.

## Flat-roof mounting

Here, the modules are attached to a special aluminium frame in order to obtain the necessary angle of installation. Special tubs of synthetic material filled with gravel also act as module mounting. This application is used on flat roofs (garages, factory buildings, etc.) or directly on the field in the open. Excellent rear ventilation and an optimal angle of installation of the module ensure a very good performance balance.

## Rule of Thumb

Only about 30 % of a flat roof surface can be used for a photovoltaic installation. The rows of modules must stand far enough apart in order to prevent shading.



### MS Constocc® Vario Excellent

The MS Constocc® Vario Excellent flat roof mounting system is very flexible to suit different applications. This construction is designed so that the ideal angle of installation of the modules can be adjusted without difficulty.



The MS Constocc® Vario Excellent flat roof mounting system can be fixed by

- weight, i.e. prefabricated concrete elements weigh down the system
- screwed fixing system with roof penetration

To choose between these two alternatives, the local conditions have to be checked carefully.

### MS Constocc® Trapez Excellent

For roofs with trapezoidal sheets, we likewise use the reliable MS Constocc® Excellent System. Also with the standing seam or corrugated asbestos roofings, we look for intelligent solutions for uncomplicated connections to the roof construction.

### In-roof mounting

In-roof mounting is a very elegant mounting solution. Here, the modules themselves form the surface of the roof. With roof integration, the modules are directly attached to the



roof substructure and there are no roof tiles underneath. Due to the necessary metal framing the roof is made impermeable.

### MS Intersole Complete Integration for Sloping Roofs

MS Intersole is the ideal system for integrating all brands and types of solar panels into sloping roofs free of problems and watertight. The clever design of overlapping plastic panels along with the special, corresponding anchors is perfectly suitable to keep your house dry. The installer can use the special anchors as a foot support to work safely and quickly. The sheets are made of recycled, low-maintenance 100 % chlorine-free plastic. The inexpensive and easy to install Intersole has been awarded the German Technical Inspection Authority (TÜV) certificate which guarantees safety and reliability.

### MS Console Professional – a complete mounting system for a simple and quick assembly of PV installations on flat roofs

MS Console Professional is an innovative system, specially designed for the installation of PV modules on flat roofs. All regular PV modules and laminates can be fixed onto MS Console Professional. This complete system includes the MS Console Professional, aluminium profiles and all mounting materials. Installation is quick and easy: simply mount the profiles to the PV module, add ballast such as gravel or concrete, and fix the PV module onto the MS Console Professional. The MS Console Professional is made of recycled, highly durable plastic, is 100 % chlorine-free and does not require any maintenance. The curves in the design protect the roof from damage. The stackable MS Console Professional is easy to transport and store, weighing only four kilos. The MS Console Professional is certified by the German TÜV Rheinland.





## Sunshine is our business.

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