

Inverter

Powerstocc® Excellent

Technical Data Sheet

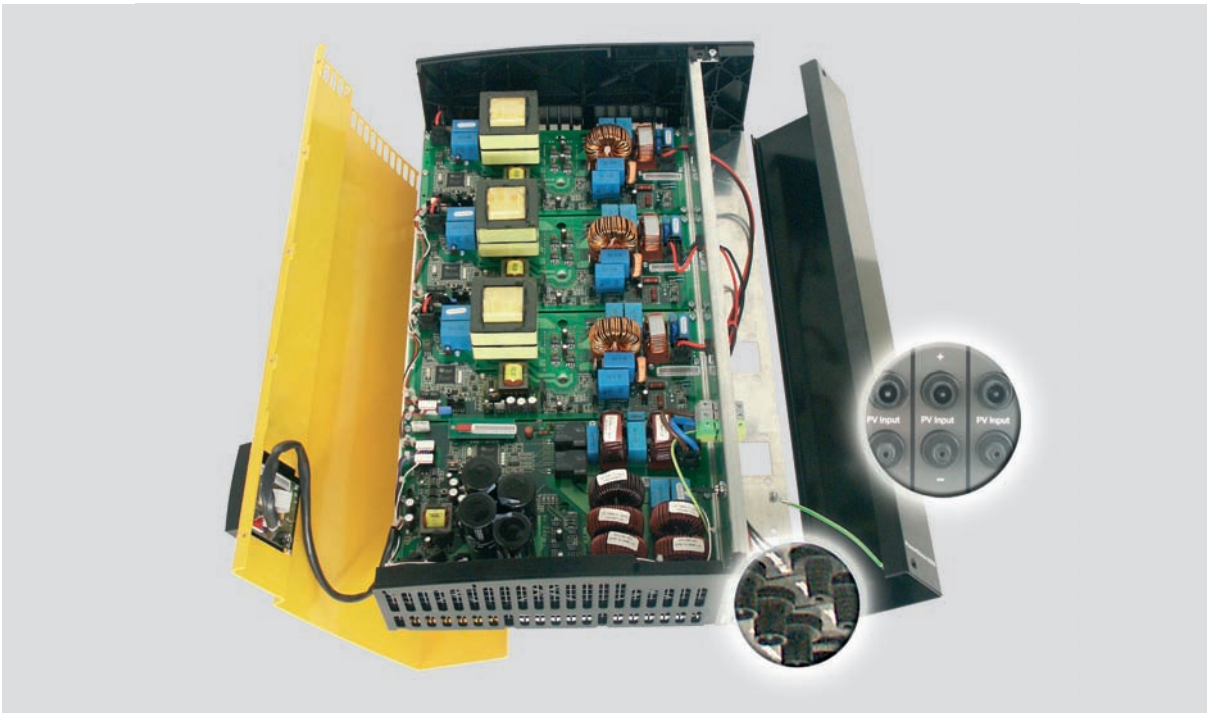


PS 1200 Excellent
PS 2000 Excellent
PS 3000 Excellent
PS 4000 Excellent
PS 5000 Excellent
PS 6000 Excellent

Powerstocc® Excellent Inverter

The most important criteria in the selection of a photovoltaic system are reliability, longevity, and the cost-benefit ratio. The inverter, the heart of the photovoltaic system, plays an important role in this regard.

Centrosolar faces this challenge and has developed the Powerstocc® Excellent inverter series in collaboration with a global corporation with the core competence in the area of industrial electronics.



The Powerstocc® Excellent Series

Centrosolar trusts the proven string technology and has designed six different modular inverter sizes from 1 kW to 6 kW. With intelligent circuitry concepts, photovoltaic systems can be operated for grid feed-in from 1 kW up to the mega watt range.



Powerstocc® Excellent

Versatility is a signature feature of the Powerstocc® Excellent inverters.

Our proven inverter series Powerstocc® Excellent was developed by highly qualified engineers.

Functional and with excellent design, this is how our new devices present themselves. For customary quality, all electric connections are integrated with connector solutions from outside.

The industrial production of inverters and the use of highly efficient electronic components are also available in the future for the photovoltaics industry. Centrosolar inverters of the Powerstoccc® Excellent series contain high-tech components that were considered until now unaffordable.

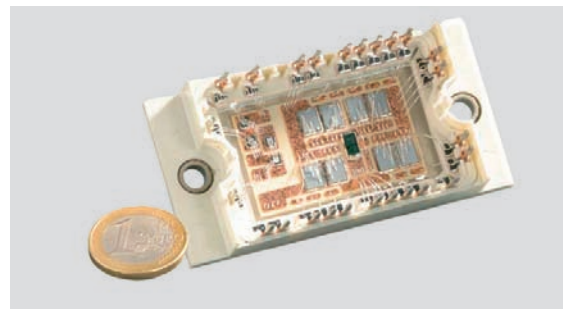
The principle by which an inverter operates consists of converting the direct current produced in the photovoltaic modules into alternating current that is compatible with the grid.

Transistors »chop« through the direct current turning it on and off at lightning speed. They produce the pre-product for the alternating current and perform the main work of an inverter with the highest requirements. Today, they mainly decide whether an inverter will work reliably for 5, 10, or 20 years.

Centrosolar is leading the way by using Danfoss Silicon Power high-performance modules.

The technology of using power transistors in a module makes them more compact and thus more reliable, as well as providing optimised heat management in the unit.

High-performance modules, also called power modules, replace the discrete power semiconductors used before. They are produced in a clean room using the most up-to-date, fully automated manufacturing plants.



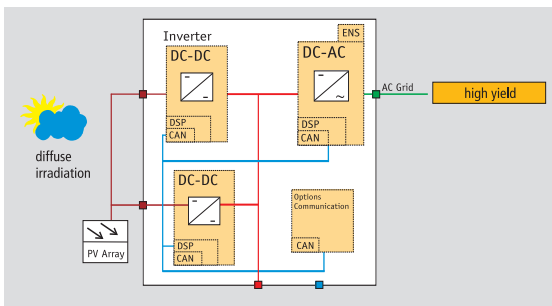
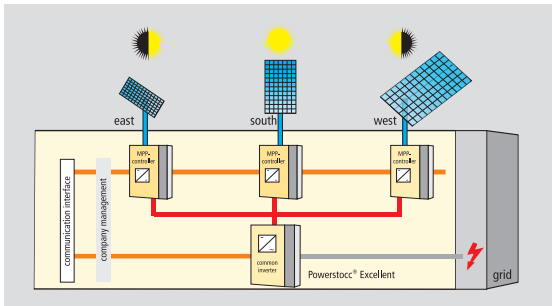
The heart of the inverter - intelligent technology requiring minimum space!

The key to the dependable production of power modules is:

- The newest manufacturing technology
- Soldering free of shrink holes in vacuum soldering furnaces, monitored via X-rays
- Exclusive use of lead-free solders
- Electric insulation final test, static and dynamic
- SPC - Statistical Process Control
- Thermal and mechanical stress simulations
- Close collaboration with independent institutes and universities
- Reliability and longevity investigations

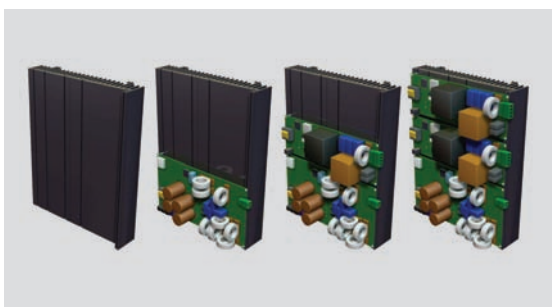
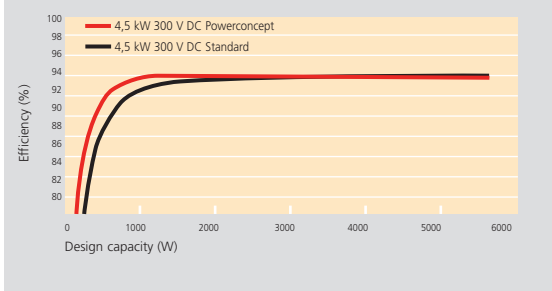


Powerstocc® Excellent - Innovation



The graph shows: during slight irradiation, the efficiency in Power concept mode is on a very high level. With a diffuse irradiation ratio of ca. 50% in Germany, every installation operator benefits from this innovation.

Important: a prerequisite is the identical operating parameters of the individual strings within the inverter.



Individual MPP Tracking

For the most common inverter configuration, every DC power module is assigned its own MPP regulator (MPP tracker). Strings with different parameters can be connected to the same inverter, for example

- installations with partial shading
- East / West installations
- different number of modules per string
- different types of modules per string

Maximum yields are guaranteed by reducing mismatching to a minimum.

Power concept

The inverters Powerstocc® Excellent 3000 and higher contain several DC power modules. In order to be able to optimally use diffuse irradiation, the strings of the inverter are interconnected, resulting in an internal master/slave function with great advantages. The work of the master is performed by the different power modules and depends on the hours of operation. The inverter automatically recognises this string configuration. Power concept guarantees high efficiency, even in the partial load range.

CAN-Bus

The reliable data transfer protocol proven in the industry takes care of the internal control of the Powerstocc® Excellent inverters. The CAN-bus technology is being used among other things in the car industry a millionfold and represents safety at the highest level. With the data communication separated galvanically from the power section, losses of the inverters are virtually impossible.

Modular Construction

Innovation means to develop a straightforward service concept. Single modules can be simply exchanged due to the consistent modular construction. The innovative architecture of the Powerstocc® Excellent inverters shows the level of the latest developments in power electronics.

Perfect & Practical Assembly

The connection of the entire periphery generally takes place in plug/connector design. On the AC-side, all Powerstocc® Excellent inverters are connected to the bottom of the housing via a connector system. The string connection is carried out in customary design as MC plug connector, and the interface connection for PC and data logger systems are realised as RJ45 (network technology).



Integrated DC Disconnect

In order to guarantee maximum safety, an electro-mechanical DC disconnect was integrated into the inverter. By closing the switch, the inverter is connected to the solar modules. It can be used to electrically disconnect the solar generator from the inverter, even under load. This switch has the necessary certifications and is characterised by a high number of switching cycles.



Communication Network

Powerstocc® Excellent inverters are equipped with an RS485 interface of the type RJ45. It is available in different versions for the home area or also for systems for professional data analysis.

Ride-Through Technology

The innovative ride-through function is a control algorithm in the inverter software that analyses and manages malfunctions on the AC-side. Non-relevant malfunctions that are caused by sporadic supply system loading allow the inverter to continue to feed into the network. The sensitive triggering systems of most inverters cannot distinguish network fluctuations from actual malfunctions and turn off the devices as a precaution. Especially in rural areas, the annual return is maximised by the ride through technology.

Technical Data

Input Quantities

	PS 1200	PS 2000	PS 3000	PS 4000	PS 5000	PS 6000
Nominal Power P_{DC}	900 W	1800 W	3000 W	3600 W	4400 W	5400 W
Max. Power P_{DCmax}	1100 W	1950 W	3200 W	3900 W	5100 W	5850 W
Start Input Voltage $V_{DCstart}$	125 V	125 V	125 V	125 V	125 V	125 V
Input Voltage Range U_{mpp}	180 V bis 350 V	180 V bis 350 V	180 V bis 350 V	180 V bis 350 V	180 V bis 350 V	180 V bis 350 V
Max. Input Voltage U_{DCmax}	450 V	450 V	450 V	450 V	450 V	450 V
Max. Input Voltage Range – U_{DCmax} Parallel string configuration	410 V	410 V	410 V	410 V	410 V	410 V
Max. Input Current I_{DC} at 40°C	10 A	10 A	2 x 10 A	2 x 10 A	3 x 10 A	3 x 10 A
Number of MPP Trackers	1	1	2	2	3	3
DC Separator	DC Disconnecter (integrated) with protected MC-4 connector system					
Surge Protection	Varistors on the DC input side and AC output side					
Voltage Ripples U_{ss}	Less than 5%					
Earth monitoring	integrated as standard					
Reverse Battery	Implemented with short-circuit diodes					

Output Quantities

	PS 1200	PS 2000	PS 3000	PS 4000	PS 5000	PS 6000
Nominal Power P_{AC}	825 W	1650 W	2750 W	3300 W	4000 W	4600 W
Max. Power P_{ACmax}	900 W	1800 W	3000 W	3600 W	4400 W	5000 W
Max. Current I_{AC}	3,3 A	6,5 A	11,3 A	13,0 A	17,5 A	19,0 A
Max. Output Current I_{ACmax}	4,0 A	8,0 A	13 A	15,5 A	19,2 A	23,0 A
System voltage/ Frequency adjustable by country	230 V +/-15 % 50 Hz +/-5 Hz	230 V +/-15 % 50 Hz +/-5 Hz	230 V +/-15 % 50 Hz +/-5 Hz	230 V +/-15 % 50 Hz +/-5 Hz	230 V +/-15 % 50 Hz +/-5 Hz	230 V +/-15 % 50 Hz +/-5 Hz
Distortion factor	< 5 %	< 5 %	< 5 %	< 5 %	< 5 %	< 5 %
Short circuit strength	line-side through current					
Phase Difference	based on the fundamental wave length of the current: 0°					

¹ 25 °C

General Quantities

	PS 1200	PS 2000	PS 3000	PS 4000	PS 5000	PS 6000
Dimensions						
Length	369 mm	369 mm	498 mm	498 mm	631 mm	631 mm
Width	386 mm	386 mm	386 mm	386 mm	386 mm	386 mm
Height (with wall bracket)	188 mm	188 mm	188 mm	188 mm	188 mm	188 mm
Protection Class	IP21					
Built-in Display	2 x 16 characters, monochrome, 4 buttons					
Indoor Weight	14 kg	14 kg	20 kg	20 kg	23 kg	23 kg
Start-up Capacity	20 W	20 W	20 W	20 W	20 W	20 W
Own Consumption at night	< 0,2 W	< 0,2 W	< 0,2 W	< 0,2 W	< 0,2 W	< 0,2 W
Energy Consumption (Standby mode)	8 W	8 W	8 W	8 W	8 W	8 W
Max. efficiency	93,40 %	93,70 %	94,20 %	94,40 %	94,30 %	94,30 %
Euro efficiency	90,70 %	91,60 %	92,90 %	93,40 %	93,40 %	93,40 %
Ambient temperature	-25 °C bis +60 °C					
Housing variations	Stainless aluminium housing, powder-coated					

Certificates

	PS 1200	PS 2000	PS 3000	PS 4000	PS 5000	PS 6000
Protection type	Protection type according to EN 60529					
Network monitoring	VDE 0126-1-1					
CE conformity EU Guidelines	73/23/EC 89/336/EEC EMV 93/68/EEC CE					
Circuit Feedback	EN 61000-3-2-3					
EMV compatability	EN 61000-6-1, EN 61000-6-2 EN/IEC 61000-4-13, EN/IEC 61000-4-14, EN/IEC 61000-4-28 ENV 50204					
EMC emission	EN 61000-6-3, EN 61000-6-4					
Safety Standard	EN 50178					
Insulation	EN 60664-1					

Subject to alterations based on continual development! Errors and omissions expected!



Sunshine is our business.

GERMANY

CENTROSOLAR AG
 Stresemannstraße 163
 22769 Hamburg
 GERMANY
 Tel.: +49 40 391065-0
hamburg@centrosolar.com

CENTROSOLAR AG
 Otto-Stadler-Str. 23c
 33100 Paderborn
 GERMANY
 Tel.: +49 5251 50050-0
paderborn@centrosolar.com

CENTROSOLAR AG
 Daimlerstraße 22
 87437 Kempten
 GERMANY
 Tel.: + 49 831 540214-0
kempten@centrosolar.com

INTERNATIONAL

CENTROSOLAR AMERICA INC.
 8350 E. Evans Road, Suite E-1
 Scottsdale, AZ 85260
 USA
 Tel.: +1 480 3482555
info.usa@centrosolar.com

CENTROSOLAR BENELUX B.V.
 De Prinsenhof 1.05
 4004 LN Tiel
 THE NETHERLANDS
 Tel.: +31 344 767002
info.benelux@centrosolar.com

CENTROSOLAR FOTOVOLTAICO
 ESPAÑA S.L.
 Moll de Barcelona s/n
 Edifici Nord, 7ª planta
 08039 Barcelona
 SPAIN
 Tel.: +34 93 3435048
info.espana@centrosolar.com

CENTROSOLAR FRANCE SARL
 Espace Européen
 15, chemin du Saquin, Batiment G
 69130 Ecully
 FRANCE
 Tel.: +33 4 69848210
info.france@centrosolar.com

CENTROSOLAR HELLAS MEPE
 Ag. Alexandrou 57-59
 17561 Paleo Faliro
 GREECE
 Tel.: +30 210 6228791
info.hellas@centrosolar.com

CENTROSOLAR ITALIA S.R.L.
 V.le del Lavoro 33
 37036 S. Martino B.A. Verona
 ITALY
 Tel.: +39 045 8781225
info.italia@centrosolar.com

CENTROSOLAR UK LTD
 Building 3, Chiswick Business Park
 566 Chiswick High Road
 London W4 5YA
 GREAT BRITAIN
info.uk@centrosolar.com