



CONERGY

Conergy PowerPlus

Our masterpiece – better than ever



Now even more output thanks
to new performance classes

Now even more security thanks
to 10-year product warranty



**Conergy is the world's
leading proprietary solar**



Conergy headquarters in Hamburg

World's only supplier of power system solutions.

Conergy possesses expertise and knowledge that is unique to the industry. This is the product of many years of experience in the development and manufacturing of solar power modules, inverters and mounting systems, as well as planning, implementation and management of photovoltaic systems all over the world. This expertise goes into every solar power system and every component that bears the Conergy name.

The same holds true of our Conergy PowerPlus solar power module – our masterpiece. Consistently high yields and a long service life are the key to maximum economy. Over 1,700,000 Conergy PowerPlus modules have already been produced – each a testament to the convincing quality of Conergy PowerPlus technology. Now we have improved PowerPlus still further, and in so doing we have created a masterpiece that is better than ever.

Conergy PowerPlus quality **“Made by Conergy” – a worthwhile investment**

- | **Consistently high yields in practical use**
- | **Superior quality for maximum durability and long life**
- | **Planning flexibility**
- | **Easy to install**





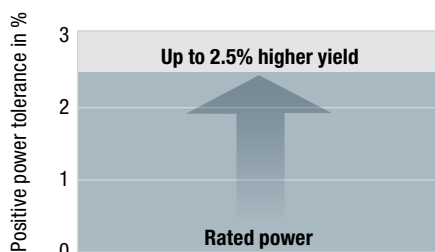
High yields in practical use

The key advantage

What does a module have to do to be good?

It has to produce consistently high yields. For at least 20 years, if not longer. After all, we want your investment in a solar power system to be worth your while financially.

Positive performance tolerance illustrated using the example of a Conergy PowerPlus module with 230 watt output



Positive performance tolerance: All Conergy PowerPlus modules produce at least the amount of solar power declared in the rated capacity. The positive performance tolerance enables this rated capacity to be surpassed by up to 2.5 %.

What does a module have to be able to do in order to be a masterpiece?

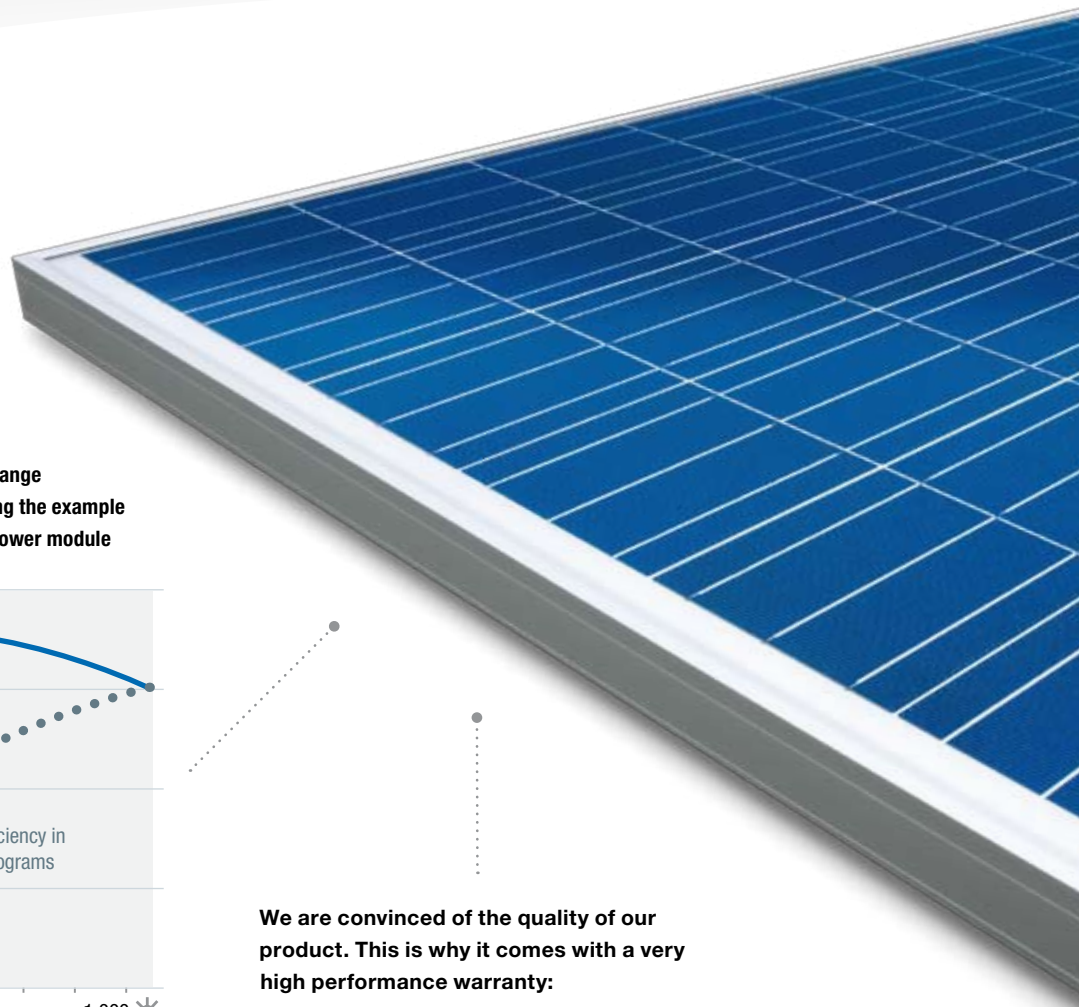
It has to meet all expectations. That means producing more energy and getting the most out of the sun, even in overcast conditions.

Conergy PowerPlus is a masterpiece: It delivers higher yields, better returns and pays back more quickly. Even after the 20-year promotion period expires, the solar power system will continue to reliably produce electricity that you can use, for example, to run appliances in your home.

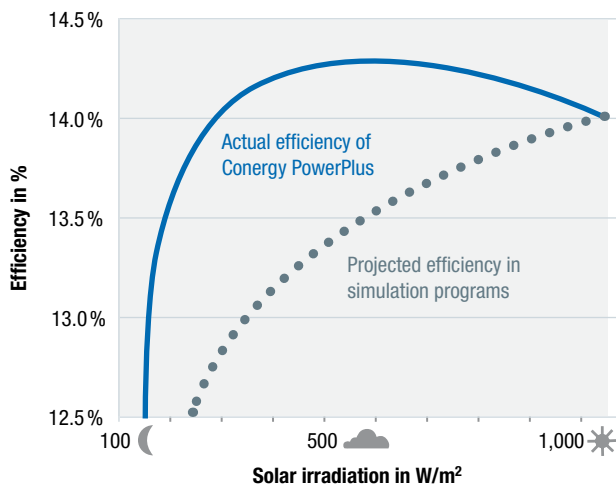


"Quality and customer service is the top priority for me. This is why I rely on Conergy PowerPlus solar systems. After nearly 200 installations, I am certain that quality pays for itself. In practice, the Conergy systems exceed the expected electricity yield significantly. Over 100 kWh/a per kW of installed output is not uncommon. This is true even in my region that is not exactly spoiled with permanent sunshine. Therefore, I trust in Conergy quality!"

Dipl. Ing. Michael Guthofer, Managing Partner at GSM Solar GmbH



Outstanding module efficiency over a range of sunlight conditions – illustrated using the example of the Conergy PowerPlus 230P solar power module



Be it cloudy skies, haze, shade or low angles of sunlight incidence, solar power systems operate two-thirds of the time in low-light conditions, even in very sunny south-facing sites. The outstanding low-light performance of the Conergy PowerPlus modules ensures an additional annual mean yield of up to 3 % compared to the forecasts of standard calculation programs.

We are convinced of the quality of our product. This is why it comes with a very high performance warranty:

- | 12-year performance warranty 1
(92 % of nominal module output from installation)
- | 25-year performance warranty 2
(80 % of nominal module output from installation)

Designed for a long service life

Conergy PowerPlus keeps its promise



Efficient and reliable in the long term thanks to high manufacturing quality

Conergy PowerPlus was designed with a special emphasis on achieving the highest standards of quality and consistently high yields over many years. All components are carefully selected and attuned to one another. They are precision-manufactured in automated production processes, which ensure that quality variance is avoided from the outset. Each stage in the production process is subject to continuous quality checks, which also eliminate hidden defects.

In practical terms, this also means that Conergy PowerPlus always delivers optimum performance and durability. We have the utmost trust in our quality. That is why we are now offering a 10-year product guarantee.

The construction type used in Conergy PowerPlus modules is certified according to the international standards IEC/EN 61215 ed. 2 (tests quality, durability and reliability of modules) and IEC/EN 61730 (tests electrical and mechanical safety), and according to UL 1703 (US testing standard).



Now even more reliable when exposed to snow and wind pressure: The modules can withstand loads of up to 6,000 Pascal and wind pressures with hurricane force. With a Conergy PowerPlus 230 module, this corresponds to a weight of twelve men standing on the module (corresponds with nearly 612 kg per m²).



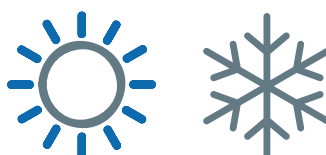
Unbreakable even under severe weather: Even if hailstones with a 55 mm diameter are falling at 120 km/h, a Conergy PowerPlus module is unharmed. The load used in the standard IEC test was surpassed here 23-fold.



Moisture-resistant: The robust materials and high manufacturing quality of the watertight, fully encapsulated junction box allow a high standard of safety and long service life. The extra plus: the passively cooled 3 bypass diodes ensure perfect operating statuses even in unfavourable environmental conditions, such as partial shade over the module.



Chemical-resistant: Be it air with a high ammonia concentration over livestock buildings or salty sea air in coastal regions. Thanks to high-quality materials and excellent sealing against external influences, our modules are resistant to long-term chemical attack. This has been confirmed by the DLG and TÜV inspection agencies.



Resistant to frost and high temperatures: Conergy PowerPlus modules withstand even extreme temperatures of between -40°C and +85°C. Climate tests demonstrate this. In this respect, the frame plays a key role: a cavity-free construction, it prevents frost damage, while special screws ensure a durable galvanic connection and electrical safety. The special run-off edge reduces the shading effect of dirt deposits on the glass.

No compromises in production

No compromises in quality



The entire module development and production facility as well as quality assurance in Frankfurt (Oder) are ISO 9001 and ISO 14001 certified.

Conergy PowerPlus Modules are manufactured to the highest German quality standards.

There are no compromises, Conergy quality is based on perfectly matching processes which are used to manufacture our premium modules. Frankfurt (Oder) is home to one of the most modern production facilities in the world for solar modules. The value creation chain runs through five production lines under one roof – from the silicon base material through the wafer and the cell, to the finished module.

1



In **wafer production**, the silicon blocks are prepared for wafer sawing: cleaning, grinding, sticking to glass and mounting plates – everything is absolutely precise and fully automated.

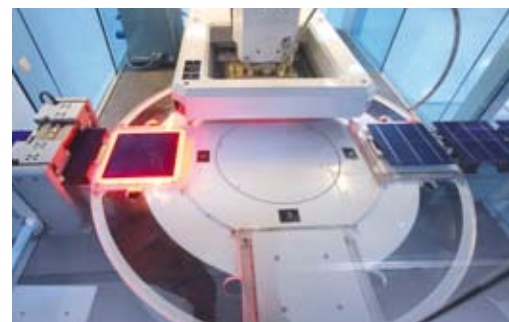
2



From the silicon block to the wafer: a job for 120-micrometre-thick wire – twice as thick as a hair. Moistened with „slurry“, 8 kilometres of wire work in parallel in the saw to cut the wafers. The result is a 180-micrometre-thick wafer.

3

From the cell **production process** stems the core element of our module. Nine perfectly coordinated process steps continuously modify the wafer to create an electricity-producing cell. The printing process gives the cell its characteristic design of 3 busbars and a conductive grid.



Our engineers in the **Technology department** check and test the modules, including their components, extensively. Using standardised test methods, they subject our modules to extreme variations in temperature (-40°C to $+85^{\circ}\text{C}$) and high humidity levels in climatic chambers. Precise characterisation of the cells and modules leads to ongoing improvements in our production. In addition to this, in-process quality tests are conducted in our laboratories on an ongoing basis. This is the only way that we can maintain and continue to improve our high quality standards.



6

As soon as the connection box has been installed, it is tested. A flasher determines the module's performance data.



5

The most important process in module generation is laminating the cells with glass to form a composite. Two ethylene vinyl acetate (EVA) films are made crystal clear using pressure and temperature, and the cells are fixed onto the glass. Together with the frame, this gives rise to one solid unit that ensures durability for the module.



4

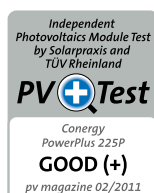
In module production, the individual cells are soldered together. They are initially assembled to form cell strings and then cross-connected to produce a cell matrix. This process is also carried out fully automatically at Conergy – thus ensuring that a consistent quality standard is maintained.



Conergy PowerPlus

In a class of its own

Top class for you



The result of our experience, precision work and care is called Conergy PowerPlus. Our masterpiece is quite impressive.

Have a look for yourself – we are among the best on the market. The commitment has paid off: for our customers, for plants with maximum yields, for years of safety in operation.

But the most important values will not be found in any table, namely the satisfaction of a system operator, the confidence of having made the right investment decision and the gratification of long-term, safe yields.





Which alignment do you prefer? Vertical or transverse assembly are permissible – for optimal surface layout!

Conergy PowerPlus – the advantages for planners and installers:

Planning flexibility

- | Two module sizes that are approved for vertical and horizontal installation. This permits the optimal surface layout and enables the system to be enhanced, e. g. for use in conditions of partial shading.
- | Suitable for universal use on roofs and open-field sites

Easy to install

- | Easy to transport and assemble thanks to its low weight
- | Secure installation thanks to reverse polarity protected plug with twist lock
- | Tested clamping areas that extend into the module corners for even more flexibility in fastening

Lightweight and high load capacity:

Conergy PowerPlus modules are among the lightest, now with as much as 6,000 Pascal load capacity.



Conergy ensures environmentally sound recycling of old modules through membership in the Association of PV CYCLE*. Solar modules that are no longer needed are disposed of and recycled for their valuable raw materials.

Conergy PowerPlus	175MC–190MC	220P–240P	220M–240M
Nominal output (P_{nom}) according to STC¹	175 Wp to 190 Wp	220 Wp to 240 Wp	220 Wp to 240 Wp
Performance tolerance	–0/+2.5 %	–0/+2.5 %	–0/+2.5 %
Module efficiency factor	Up to 14.43 %	Up to 14.74 %	Up to 14.74 %
Cells	48	60	60
Cell type	Monocrystalline cell incorporating 3-busbar technology	Polycrystalline cell incorporating 3-busbar technology	Monocrystalline cell incorporating 3-busbar technology
Plug	Connector with integrated twist lock	Connector with integrated twist lock	Connector with integrated twist lock
Module dimensions (L x W x H)²	1,335 x 986 x 46 mm	1,651 x 986 x 46 mm	1,651 x 986 x 46 mm
Module weight³	15.5 kg	19.6 kg	19.6 kg
Maximum permissible load	6,000 Pa ⁴		
Certification	According to IEC/EN 61215 Ed. 2, IEC/EN 61730, UL 1703 (USA) and MCS (UK)		
Product warranty⁵	10 years		
12-year performance warranty⁵	At least 92 % rated capacity		
25-year performance warranty⁵	At least 80 % rated capacity		

This table shows an excerpt only. The information given in the technical data sheets and terms of warranty is authoritative.

1 Standard test conditions defined as follows: 1,000 W/m² radiant power at a spectral density of AM 1.5 (ASTM E892), cell temperature of 25°C.

2 Dimensional tolerance: +/–1 mm.

3 Weight tolerance: +/–0.5 kg.

4 In accordance with IEC 61215 Ed. 2.

5 According to Conergy AG's current warranty conditions.

* Only applies to PV CYCLE member countries.

Conergy solar power systems are a worthwhile investment all over the world. In all conditions of use



Conergy solar power systems have been tried and tested over many years in Europe and overseas. With outstanding low-light performance and a general resistance to environmental influences, they deliver the best possible yields in all weather regions.

Whether for single-family homes, commercial buildings, commercial sites or multi-megawatt solar parks, Conergy solar power systems are highly profitable in practice.



Reference systems: Correns (Var), France

Output:	131 kWp
Number of Conergy PowerPlus 220P:	612
CO₂ saving:	71 t/year
Solar power production:	157,000 kWh
Specific yield:*	1,198 kWh/year



Reference systems: Grand Hotel Serena car park in Torre Canne di Fasano, Italy

Output:	610.65 kWp
Number of Conergy PowerPlus 225P:	2,714
CO₂ saving:	393 t/year
Solar power production:	850,000 kWh
Specific yield:*	1,392 kWh/year

Reference systems: Konitsa, Greece

Output:	99.66 kWp
Number of Conergy PowerPlus 220P:	453
CO₂ saving:	85.55 t/year
Solar power production:	145,000 kWh
Specific yield:*	1,455 kWh/year





Reference system: Officecamp Lübeck, Germany

Output:	23.46 kWp
Number of Conergy PowerPlus 230P:	102
CO₂ saving:	20.91 t/year
Solar power production:	23,554 kWh
Specific yield:*	1,004 kWh/year



Reference system: single-family home in Osloss, Germany

Output:	8.94 kWp
Number of Conergy PowerPlus 220/230P:	40
CO₂ saving:	8.4 t/year
Solar power production:	9,459 kWh
Specific yield:*	1,058 kWh/year



Reference system: solar park in Thüngen, Germany

Output:	18.7 MWp
Number of Conergy PowerPlus 215-225P:	84,986
CO₂ saving:	10,000 t/year
Solar power production:	18,600 MWh
Specific yield:*	1,027 kWh/year



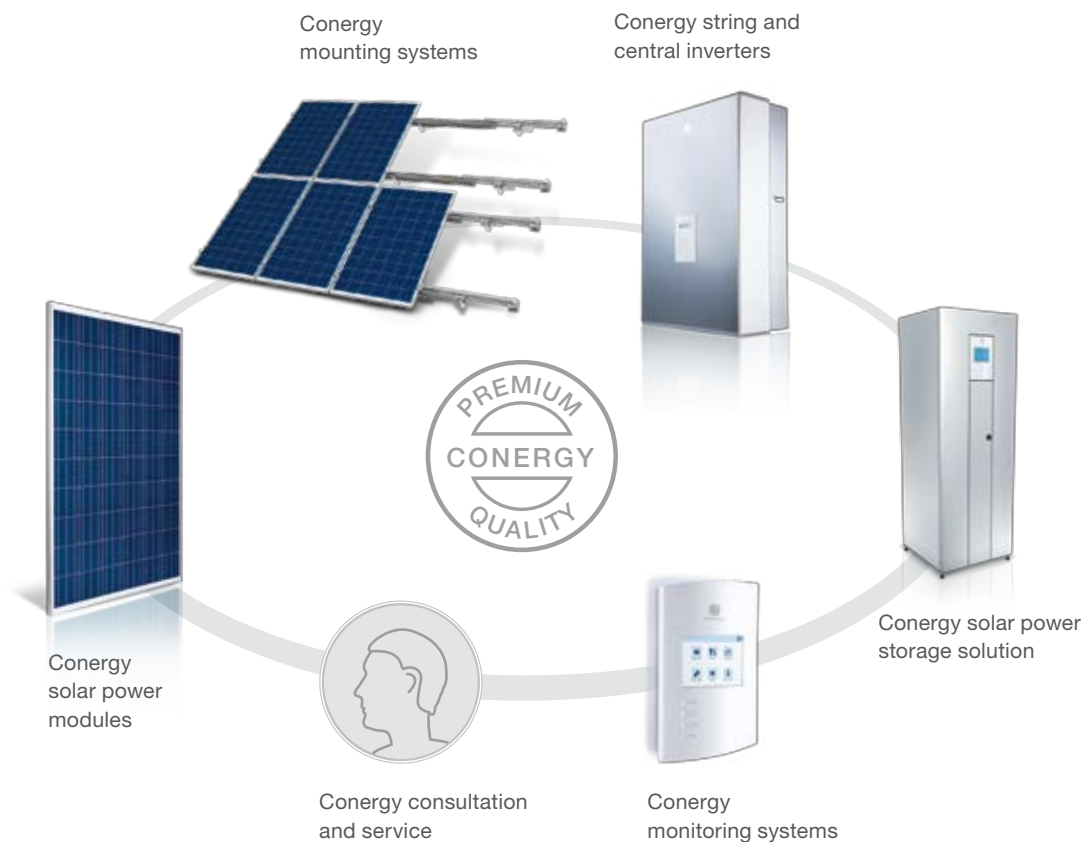
* Energy generated by the solar power system per year measured in kWh/system size in kWp.

The Conergy solar system: High-quality solar energy systems “Made by Conergy”.

Conergy is a pioneer in the solar industry and, as a global player, the world's only provider of solar system solutions that are manufactured entirely in-house.

The high quality level of Conergy photovoltaic systems is verified in regular quality control checks. Photovoltaic systems made by Conergy have already proven themselves thousands of times in practice and are used around the world under the most diverse conditions.

We invest this experience in the day-to-day development of our systems. This results in photovoltaic systems that have the best possible yield, an extremely long service life and low maintenance costs.





OUR WORLD IS FULL OF ENERGY.



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