Solar energy -

the best investment in your future.

GermanSolar™

We take responsibility for our environment, for climate Protection and for the development sustainable energy supply - with renowned expertise from Germany.

GermanSolar™

Quality makes all the difference.

GermanSolar offers individual and customised complete solutions for solar power systems – from domestic rooftop systems to solar power plants in the multi-megawatt range. Whether it is a solar module, inverter or mounting system: all GermanSolar components offer long-lasting quality, well-engineered functionality and an attractive design.

As a subsidiary of the Danish Photonic Energy A/S, our customers benefit from the strengths of one of the world's largest solar-module OEM companies. Our products are developed in Germany and manufactured in the Group's own ultra-modern production facilities across the globe or in connection with partners who lives up to the high standards of the group.

Each location fulfils the highest quality standards based on ISO certification. Over 50 specialists ensure that these strict requirements are fully met.
The large-scale solar power plants completed by GermanSolar as general contractor are a testament to the expertise of our employees and the quality of our products. The know-how demonstrated in this extremely exacting professional environment is applied with equal success in all other areas.

The solar expertise of our German and Danish engineers is of major importance to our research and development work. "German Engineering" forms the solid basis for our sustainable solutions, which meet the highest quality standards.



Time for change – climate protection with solar power.

An abundance of clean energy.

A form of energy that is sustainable and does not harm the environment in any way has long been proven as a real possibility. What could be a more obvious form of energy than the sun? Its rays provide us with a constant abundance of clean energy. In just 20 minutes, the sun emits enough energy to meet global requirements for a year!
In every corner of Europe, an abundance of sunlight is guaranteed, even with overcast skies. This is a form of energy that you can harness with the help of our solar power systems. An energy that has the potential to change our lives, our existence and our future.

Solar energy in the power grid.

The method of transforming solar energy into electricity is known as solar power or photovoltaics. Solar power represents a major shift in the energy market. While electricity harnessed from solar energy was previously a rarity, solar power systems now play an increasing role in meeting energy requirements. Most solar power systems in Germany are connected to the grid. This means that electricity produced on roofs, building facades or in field installations can be fed into the public grid just as well as it can be used by the producer. Both options are currently remunerated or funded by the government – over a period of 20 years. Most developed countries today have their own solar power program which are attractive, but varies from one country to the next. Please check how it works in your country.

Getting the most out of a solar power system .

When it comes to the profitability of a solar power system, the quality and efficiency of the components are decisive.
These are factors all future solar system owners must consider when making their purchase. That is why quality, efficiency and design are key focuses in the development of GermanSolar modules. GermanSolar guarantees:

- 12 years of performance guarantee at 90% of nominal capacity
- 25 years of performance guarantee at 80% of nominal capacity

Other important aspects for a high yield include optimum positioning for solar exposure and an absence of shade, error-free operating and a long system lifespan. With a system in Mid-Europe, you can produce an annual average of between 800 and 1,000 kilowatt-hours per kilowatt peak (kWp). This is positive proof that harnessing renewable energies is not just good for the environment. Numerous remuneration and funding tariffs also ensure financial reward.

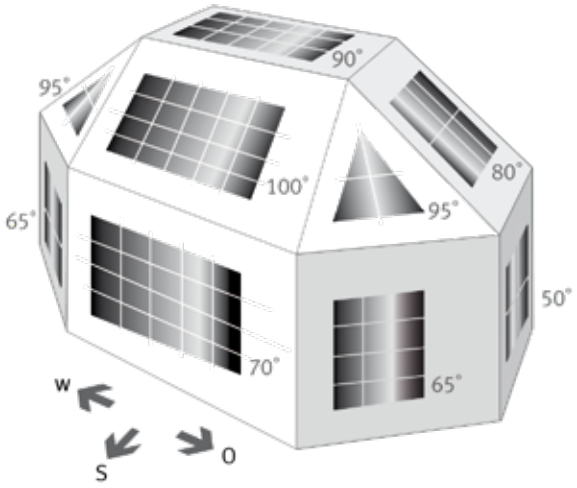
Solar power instead of nuclear power, coal and oil.

Time for an energy revolution.

Time for an energy revolution!
Nuclear power as well as fossil fuels will and must be changed into other forms of energy and the alternative is right in front of our eyes:
The sun – an abundant source of clean, sustainable energy. In just 20 minutes, the sun emits enough energy to meet global requirements for a year. So why not make the quick, simple transition to solar power now?

The electricity generated by a solar power plant itself can be used by itself or be fed into the national grid. Depending on the country there are different compensations for it.

It's so easy to get your solar power system up and running.
It is very important to have your solar power system installed by an expert. As a recommended partner of GermanSolar, the expert will offer you advice as well as planning and mounting your solar power system. Installation on a sloped roof is made simple with our own mounting system; "GermanClick". This, the rooftop mounting system is specially developed for GermanSolar modules by our own engineers. With a skilled professional at your side, you can trust that your system will be installed promptly and will provide faultless, performance-optimised operation from the very first moment.



The image compares the energy yield of modules arranged in various positions on a building.

We'll help you become a private energy producer!

Advantages that speak for themselves:

- **Ecology**
  A proven way to protect the environment
- **Sustainability**
  Does not require fossil fuels or nuclear power
- **Savings**
  Reduces your energy costs

Examples of how photovoltaic systems from GermanSolar AG can be installed for reliable profit:

Private houses

Solar modules look attractive thanks to the German-Click powder-coated mounting system in black. Roofs with various orientations can be used optimally for photovoltaic systems.

Industrial buildings

Modules are installed on flat roofs using elevating frames to achieve the optimum orientation to the sun. This allows the solar power to work at full capacity.

Large-scale plants

On specially designed buildings, the entire roof space is used to optimise yield. This solar power plant in Germany's Allgäu region has a capacity of 220 kWp.

Solar parks

GermanSolar AG develops, delivers and installs solar parks in the megawatt range all across Europe, providing planning, delivery, construction and connection.

With a solar system from GermanSolar, you can earn money, reduce your energy costs and help protect the environment.

Solar expertise for your plant.

Benefit from our experience with large-scale solar power plants

GermanSolar is a specialist partner providing solutions for solar power systems of all sizes. We have proven our expertise and ability by the construction of a number of large solar-parks; the largest so far being a solar park on the site of a former brown-coal power plant in Trattendorf, Saxony. With a total capacity of 8 MW, this impressive solar park allowed us to transform wasteland into a source of clean energy for the future. The project was financed, overseen and funded by UmweltBank. Here is an extract from a press release from the bank:

Use of wasteland.

The solar park is located in the "Schwarze Pumpe" industrial area. For over 100 years, the area on the outskirts of Zerre in Upper Lusatia has been mined for brown coal. The first large power plant in Trattendorf was in operation from 1917 until 1945. The second power plant was a new construction on the same site and was in operation until its decommissioning in 1996. The site then lay unused and neglected for years. In 2010, the wasteland area was redeveloped with the 18-hectare Zerre solar park. A disused site was therefore put to valuable use and no further green land was developed. The field-installed photovoltaic plant comprises a total of seven individual solar parks, each with a capacity of between 1 and 1.5 MW. The solar modules, numbering around 38,100 pieces, were provided by GermanSolar AG acting in partnership with its parent group. The installation of the modules and inverters as well as the manufacturing of the module frames were completed in completed in cooperation with local companies. This created new jobs and strengthened the local economy.

Respecting nature.

During the planning and completion of the project, issues concerning environmental protection were given particular attention. For example, the park's module frames were made using local pinewood. Bat houses and incubators for the rare woodlark were installed to preserve the habitat of the local wildlife surrounding the solar park. Meanwhile, nature has begun to reclaim the site of the former brown-coal power plant; several bird species use the wooden frames for nesting and various plant species are now growing between the module rows, providing a habitat for small animals.

Energy supply for 3,000 households.

The solar park has been fully connected to the electricity grid since 2010 and produces 7.4 million kWh of green electricity per year without any noise or air pollution. That is enough to provide up to 3,000 households with environmentally friendly electricity. This provides an annual saving of approximately 3,950 tonnes of CO_2. The Zerre solar park therefore makes an important contribution to a more environmentally friendly and future-orientated energy supply.

PowerLine

Outstanding features of the PowerLine by GermanSolar:

- Flash-Data for every panel
- Low chance of mismatching due to extremely low power tolerance of +/-3 %
- Positive classification -0/+4,99 Watt
- Individuell testing and surveying, quality assurance by permanent production control incl. EL-test
- Highest stability thanks to aluminium frame made from a double-walled hollow chamber profile
- Outstanding design thanks to black powder-coated solar panel frame
- Chamfered frame – resulting in improved water drainage and snow run-off
- Three bus bar design guarantees high output power from the solar modules
- Good performance by diffused sunlight
- High stability, Load capacity: 5400 Pa (Snowload)
- **Made in Germany**

- Monocrystalline | GSM6-245/250/255/260-PO60

GermanSolar™

PowerLine black

Outstanding features of the PowerLine by GermanSolar:

MADE IN GERMANY

- Flash-Data for every panel
- Low chance of mismatching due to extremely low power tolerance of +/-3 %
- Positive classification -0/+4,99 Watt
- Individuell testing and surveying, quality assurance by permanent production control incl. EL-test
- Highest stability thanks to aluminium frame made from a double-walled hollow chamber profile
- Outstanding design thanks to black powder-coated solar panel frame and black backsheet
- Chamfered frame – resulting in improved water drainage and snow run-off
- Three bus bar design guarantees high output power from the solar modules
- Good performance by diffused sunlight
- High stability, Load capacity: 5400 Pa (Snowload)
- **Made in Germany**

- Monocrystalline | GSM6-245/250/255/260-PO60B

WARRANTY ON MATERIALS 10 YEARS

POWER WARRANTY 12 YEARS GUARANTEED TO OPERATE AT 90% OF POWER

POWER WARRANTY 25 YEARS GUARANTEED TO OPERATE AT 80% OF POWER

www.germansolar.com

PremiumLine

Outstanding features of the PremiumLine by GermanSolar:

- Flash-Data for every panel
- Low chance of mismatching due to extremely low power tolerance of +/-3 %
- Positive classification -0/+4,99 Watt
- Individuell testing and surveying, quality assurance by permanent production control incl. EL-test
- Highest stability thanks to aluminium frame made from a double-walled hollow chamber profile
- Outstanding design thanks to black powder-coated solar panel frame and black backsheet
- Chamfered frame – resulting in improved water drainage and snow run-off
- Good performance by diffused sunlight
- Extremely stable by using 4 mm special-purpose glass Load capacity: 5400 Pa (Snow and Windload)

- Polycrystalline | GSP6-230/235/240-PR60
- Polycrystalline | GSP6-190/195/200-PR50

GermanSolar™

SilverLine

Outstanding features of the SilverLine by GermanSolar:

- Flash-Data for every panel
- Positive classification -0/+4,99 Watt
- Individuell testing and surveying, quality assurance by permanent production control incl. EL-test
- Highest stability thanks to aluminium frame made from a double-walled hollow chamber profile
- Three bus bar design guarantees high output power from the solar modules
- Good performance by diffused sunlight
- Passed Ammonia Gas and Salt Mist Corrosion Resistance Test
- High stability, Load capacity: 5400 Pa (Snowload)

- Polycrystalline | GSP6-225/230/235/240/245/250-SI60

WARRANTY ON MATERIALS 10 YEARS

POWER WARRANTY 10 YEARS GUARANTEED TO OPERATE AT 90% OF POWER

POWER WARRANTY 25 YEARS GUARANTEED TO OPERATE AT 80% OF POWER

www.germansolar.com

GermanSolar

Mounting systems.

Guaranteed quick, easy and safe.

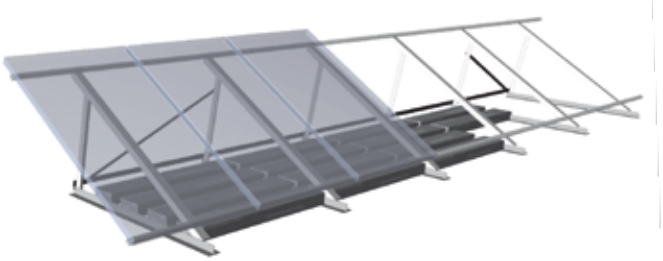
A lot easier and quicker than you might think: with a mounting system from GermanSolar, installing a solar power system on your roof is unbelievably easy and straightforward. We are even able to guarantee the reliable and long-lasting quality of our systems with a 20-year product guarantee!

Rooftop mounting

A particular feature of our “GermanClick” modular rooftop mounting system is how simple it is to handle. The cross-connected modular system allows the mounting of two or three modules, parallel and in rows. No further processing of the materials is required during mounting on site. All profile intersections are connected with corresponding made-to-measure components. The assembling jigs also supplied allow individualised connection for all profile arrangements, without the need for additional measuring equipment. The system allows mounting on a very broad range of roofing types and on detached houses, apartment buildings or industrial buildings. Various roof mounting anchors or schrews are available for the roof substructure connection. A further advantage: because each module is only attached at the top and bottom edges in a double T rail, “GermanClick” requires significantly fewer fixing rails (and therefore fewer fixing points) than traditional systems. All with the same or improved stability and strength.

Flat-roof mounting

Special aluminium frames tilt the photovoltaic modules to the optimum angle for sun exposure. The frames are bolted to the roof substructure or fixed with concrete blocks (kerbstones). It is therefore important that particular attention is given to the structural condition of the roof. This type of mounting is especially suitable for garages and factory buildings, for example, and offers a particularly high performance level. This is because the modules can be well ventilated at the back and optimally positioned to maximise sunlight exposure.



„GermanClick“:
the system for perfect rooftop mounting.

- Cross-mounting systems for extra-high stability
- Fewer fixing points
- Optimum rear ventilation – modules form a closed surface (chimney effect)
- Increased yield as snow slides off easily
- Standardised special hooks with height adjustment
- Modular mounting systems, specially developed for GermanSolar modules
- First-class design with powder-coated profiles

PowerLine (black)

Mechanical data

- Dimensions 1.650 x 990 mm
- Thickness 40 mm
- Weight ca. 19 kg
- Laminate/glass 3,2mm extra tempered safety glass
- black powder-coated
- Deformation 1.2° at the module level
- Surface load 5400 Pa max.

Technical data

The following calculations are based on the electrical data from 60 monocrystalline cells.

PremiumLine 50

Mechanical data

Dimensions 1.650 x 827 mm
Thickness 40 mm
Weight ca. 19 kg
Laminate/glass 5,8mm /4 mm ESG extra-white
impact resistance in accordance with DIN 52337
black backsheet
Deformation 1.2° at the module level
Wind and snow load 5.400 Pa max.

Technical data

The following calculations are based on the electrical data from 50 polycrystalline cells.

Type	GSM6-245-PO60(B)	GSM6-250-PO60(B)	GSM6-255-PO60(B)	GSM6-260-PO60(B)	GSP6-190-PR50	GSP6-195-PR50	GSP6-200-PR50
Power rating Pmpp	245 Wp	250 Wp	255 Wp	260 W	190 Wp	195 Wp	200 Wp
Rated current Impp	8,09 A	8,11 A	8,21 A	8,39 A	7,52 A	7,54 A	6,93 A
Rated voltage Vmpp	30,58 V	31,14 V	31,27 V	31,45 V	25,27 V	25,50 V	28,98 V
Short-circuit current	8,68 A	8,71 A	8,79 A	8,93 A	8,00 A	8,10 A	7,92 A
Open-circuit voltage Voc	36,98 V	37,04 V	37,28 V	38,16 V	30,60 V	31,05 V	36,00 V
Module efficiency	14,70 %	15,00 %	15,30 %	15,60 %	14,05 %	14,41 %	14,78 %

NOCT	+47 °C	NOCT	+47 °C
Temp.coeff. P	-0,451 %/K	Temp.coeff. P	-0,44 %/K
Temp.coeff. Is	+0,045 %/K	Temp.coeff. Is	+0,075 %/K
Temp.coeff. Voc	-0,325%/K	Temp.coeff. Voc	-0,343 %/K
Bypass diodes	3	Bypass diodes	3 x in the junction box
Junction box	IP 65	Junction box	Certified special box with tension spring clamps
Connector	2 x 1,00 m, 4 mm², MC 4 m plug-in system	Connector	1 m plug-in system
Maximum permissible values	Sytem voltage 1.000 V Rated power tolerance +/-3 % Classification: -0/+4,99 W Operating temp.range -45 bis +45 °C	Maximum permissible values	Sytem voltage 1.000 V Rated power tolerance +/-3 % Classification: -0/+4,99 W Operating temp.range -40 bis +85 °C
Protection class	2	Protection class	2

The product manufacturing process for solar module components is based on glass - laminate - technology. In this process, the high quality of the laminate structure is achieved thanks to the laminate and the completely sealed edges. This ensures that the panel will have an extremely long life.

Qualification

This special laminate is certified in accordance with IEC standards 61215 2nd. Ed. and 61730. ID:0000023436 TÜV Rheinland.

Quality

The production facility is TÜV-, MCS-, IEC-, CE-, FSEC-, CEC-, CSA- and ISO 9001:2000-certified, and validated in accordance with EMAS II. Regular individual inspections ensure that the products' electrical, optical and mechanical properties are always of the highest quality.

PremiumLine 60

Mechanical data

Dimensions 1.650 x 990 mm

Thickness 40 mm

Weight ca. 19 kg

Laminate/glass 5,8mm /4 mm ESG extra-white

impact resistance in accordance with DIN 52337

black backsheet

Deformation 1.2° at the module level

Wind and snow load 5.400 Pa max.

Technical data

The following calculations are based on the electrical data from 60 polycrystalline cells.

GSP6-230-PR60	GSP6-235-PR60	GSP6-240-PR60
230 Wp	235 Wp	240 Wp
7,48 A	7,57 A	7,69 A
30,78 V	31,05 V	31,23 V
8,04 A	8,15 A	8,24 A
37,08 V	37,32 V	37,41 V
14,25 %	14,55 %	14,86 %

NOCT	+47 °C
Temp.coeff. P	-0,44 %/K
Temp.coeff. Is	+0,075 %/K
Temp.coeff. Voc	-0,343 %/K
Bypass diodes	3 x in the junction box
Junction box	Certified special box
	with tension spring clamps
Connector	1 m plug-in system
Maximum	Sytem voltage 1.000 V
permissible values	Rated power tolerance +/-3 %
	Classification: -0/+4,99 W
	Operating temp.range -40 bis +85 °C
Protection class	2

SilverLine

Mechanical data

Dimensions 1.650 x 990 mm

Thickness 50 mm

Weight ca. 21 kg

Anodized aluminum

Surface load 5400 Pa max.

Technical data

The following calculations are based on the electrical data from 60 polycrystalline cells.

GSP6-225-SI60	230-SI60	235-SI60	240-SI60	245-SI60	250-SI60
225 Wp	230 Wp	235 Wp	240 Wp	245 Wp	250 Wp
7,70 A	7,87 A	8,00 A	8,05 A	8,28 A	8,33 A
29,20 V	29,20 V	29,60 V	29,80 V	29,60 V	30,00 V
8,28 A	8,38 A	8,45 A	8,56 A	8,73 A	8,89 A
36,60 V	36,60 V	37,20 V	37,40 V	37,40 V	37,60 V
13,80 %	14,10 %	14,40 %	14,70 %	15,10 %	15,30 %

NOCT	+47 °C
Temp.coeff. P	-0,44 %/K
Temp.coeff. Is	+0,069 %/K
Temp.coeff. Voc	-0,334 %/K
Bypass diodes	6/3 x in the junction box
Junction box	Certified special box
	with tension spring clamps
Connector	0,90 m plug-in system
Maximum	Sytem voltage 1.000 V
permissible values	Classification: -0/+4,99 W
	Operating temp.range -45 bis +85 °
Protection class	2

All electrical values are based on perpendicular solar irradiation at 1.000 W/m2 and a temperature of 25 °C (normal conditions with AM = 1,5).

Photovoltaics planning sheet

Date _____

Specialist company

Company _____

Street _____

Postcode, City _____

Contact person _____

Phone number _____

E-Mail _____

Building project

Name _____

Street _____

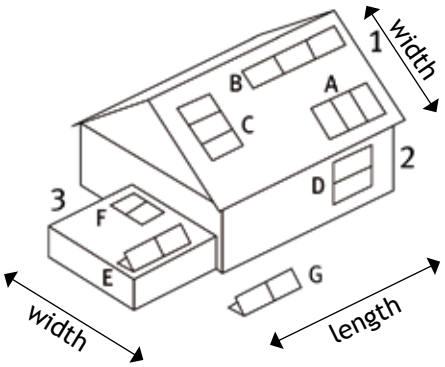
Postcode, City _____

Phone number _____

E-mail _____

Questions and notes _____

Details of photovoltaic system



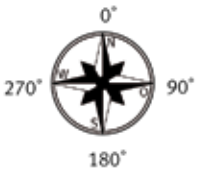
☐ Sloped roof ☐ Facade ☐ Flat roof

☐ A ☐ B ☐ C ☐ D ☐ E ☐ F ☐ G

Available surface area (L x W) _____ x _____ m eaves

Roof alignment _____ degrees

Roof inclination _____ degrees



Roof cladding ☐ tile* ☐ metal plate* ☐ gravel ☐ plastic material ☐ bitumen

Roof structure ☐ steel* ☐ wood ☐ Rafter spacing _____ cm

Structures integrated in the roof space should be detailed in a drawing, including number, size and arrangement. External and internal obscuring structures should be provided in a site drawing (length, width, height).

Where is the meter panel space? ☐ cellar ☐ hall ☐ living space ☐ storage space ☐ garage

Is any other meter panel space available? ☐ yes ☐ no

Are any empty conduits available for cabling between the roof and cellar? ☐ yes ☐ no

Cable length from modules to inverter: _____ m

Where should the inverter be installed? ☐ cellar ☐ roof framework ☐ garage ☐ other _____

Installed capacity required: approx. _____ kWp, maximum investment sum: approx._____ Euro

* Please provide separate information on tiles, type of metal plate/plastic material and roof boards, including manufacturer, product description and design of the substructure (see back of page).

GermanSolar™

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