

SunCarrier 120 | 160 | 220 | 250 | 260 | 300



Tracking system of the future

Uniquely efficient technology for tomorrow's energy

The sun, the greatest source of available energy, generates approximately 1.08×10^{18} kilowatt hours (kWh) per annum – about 10,000 times more than the world's primary energy requirements. Part of this solar energy can be transformed into electrical power with the help of photovoltaics.

It is the goal of a+f GmbH to increase this share of renewable energy production as efficiently as possible. As a subsidiary of the GILDEMEISTER group, the world's leading manufacturer of metal-cutting machine tools, a+f GmbH represents a long and successful traditional excellence in mechanical engineering.

On the basis of this experience, combined with the requirements of the industrial use of solar energy, the SunCarrier tracking systems have been developed. These intelligent systems adapt themselves with their tracking through the vertical axis always perfectly to local conditions such as duration of sunshine and angle for capturing sunlight. a+f GmbH offers you turnkey project solutions, maximum energy yield and extremely interesting amortisation periods. Besides the realisation of these projects a+f GmbH offers as well operation and maintenance of the solar power plants.



Benefits of the SunCarrier

Any forces impacting on the system are immediately directed into the foundation via the closed box of the steel structure without affecting the moving parts. This eliminates pitching movements very effectively. The SunCarrier therefore continues to work at maximum output when other systems are deflected by the wind.

In comparison to conventional tracking systems

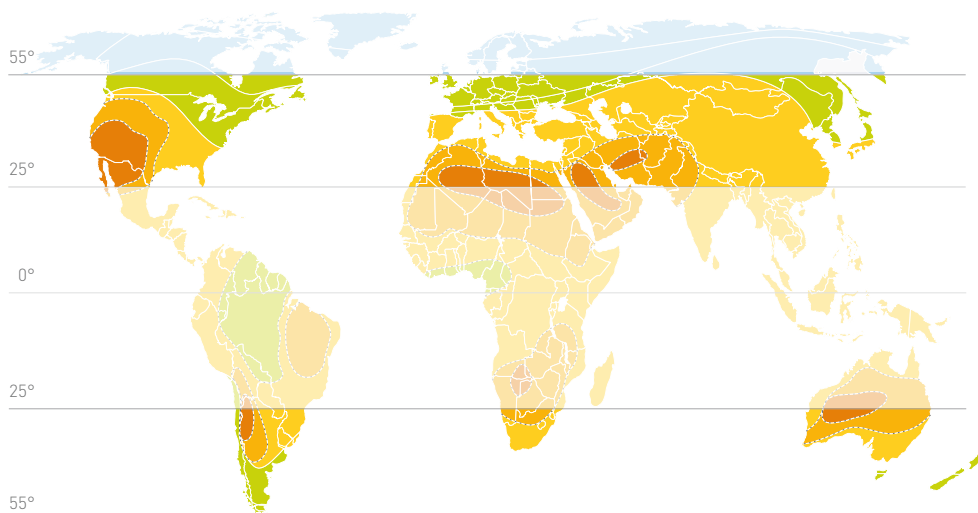
Many tracking systems seem to be loose or not robust enough. The central mast arm of a long-lasting and stable system must also withstand quickly changing gales, which attack with massive torque. The consequences of insufficiently stable construction include high material costs, higher levels of materials fatigue and the appearance of a dangerous pitching motion, which can lead to the destruction of the tracking system and the modules.

For every application a suitable solution

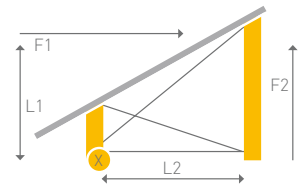
To achieve the highest possible energy yields solar power plants must adjust their module surface optimally to the current position of the sun. Only this adjustment ensures an optimum angle for capturing sunlight so that maximum yields can then be guaranteed. The angle for capturing sunlight depends on the degree of latitude as well as the season and time of day.

In operational areas between 25° and 55° north or south latitude, the SunCarrier tracking systems provide the perfect adjustment of the solar modules to the current position of the sun. Compared to fixed installations, an additional yield of up to 35 % can be generated.

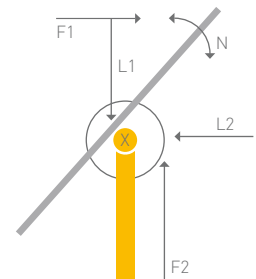
Area of deployment: between 25° to 55° north or south latitude



Solar radiation for solar power plants ■ perfect ■ very good ■ good ■ suitable ■ unsuitable



F = Force L = Distance
N = Pitching motion X = Fixpoint



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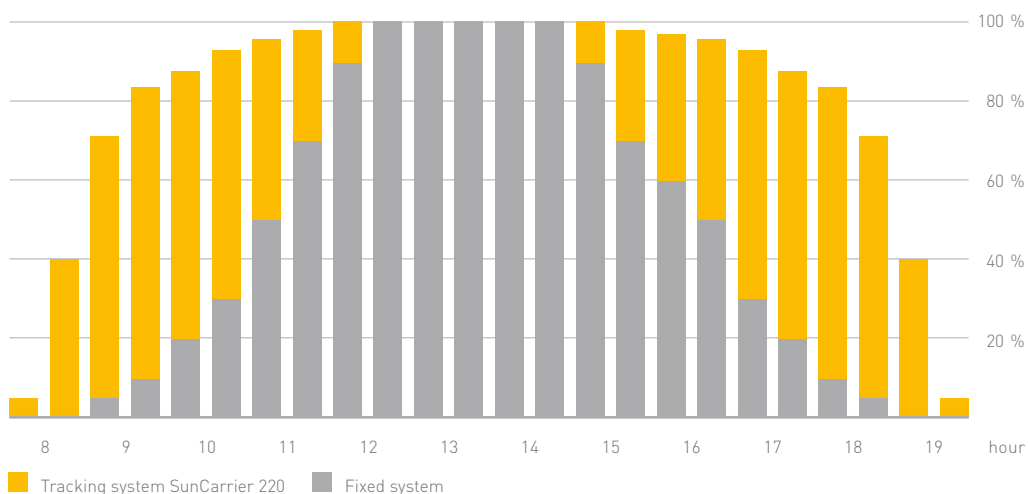
Profitable investment

Customers and investors who are interested in the profit-oriented and future-proof generation of solar power, as well as the best possible return on their investment, should decide for the SunCarrier. The continuous alignment of the module surface towards the current position of the sun significantly increases the energy yield of the solar modules thereby reducing cost per generated kilowatt hour. Particularly during the summer months, the SunCarrier guarantees an increased yield in comparison to conventional market solutions. In terms of economic efficiency, the SunCarrier is significantly superior to other systems for reasons of size, stability, low maintenance, efficiency and intelligent design features. These make it an enormously profitable and above all, future-proof investment. Through continuing development of our product line, we supplement and optimise our value proposition for customers with diverse requirements in terms of market, location, technology and investment environment.

Seasonal output comparison (January 07 to January 10)



Daily energy gain by tracking



Technical details

SunCarrier model	SunCarrier 120	SunCarrier 160	SunCarrier 220	SunCarrier 250	SunCarrier 260	SunCarrier 300
Rotational axis	azimuth (solar angle of arrival), single-axis tracking system, tracking through vertical axis					
Rotational angle	summer – max. 220° (June 21st), winter – min. 110° (December 21st)					
Module	all common types and sizes of modules may be used					
Recorded power output	up to 24,000 Wp*	up to 30,000 Wp*	up to 40,000 Wp*	up to 46,000 Wp*	up to 48,000 Wp*	up to 53,000 Wp*
	[*Watt peak = standard by which the power of solar cells and solar modules is measured], depending on the module type					
Pitch angle of module surface	30° to the horizontal	40° to the horizontal	30° to the horizontal			
Installation area (width x height of standard model)	119,58 m ² 16,16 m x 7,40 m (1,287.15 sq ft; 53.02 ft x 24.28 ft)	163.20 m ² ; 1.60 m x 17.00 m = 27.00 m ² (1,754.52 sq ft; 5.25 ft x 55.77 ft = 290.63 sq ft) total of six rows	212.10 m ² ; 21.00 m x 10.10 m (2,283.35 sq ft; 68.9 ft x 33.14 ft)	247.52 m ² ; 22.10 m x 11.20 m (2,664.74 sq ft; 72.51 ft x 36.75 ft)	247.52 m ² ; 22.10 m x 11.20 m (2,664.74 sq ft; 72.51 ft x 36.75 ft) module surface area can be extended up to 5 %	287.50 m ² ; 23.00 m x 12.50 m (3,094.61 sq ft; 75.64 ft x 41.01 ft)
Height above clearance surface	approx. 4.30 m (14.11 ft)	approx. 4.00 m (13.12 ft)	approx. 6.00 m (19.69 ft)	approx. 6.50 m (21.33 ft)		approx. 7.20 m (23.62 ft)
Foundation	Screw-in foundation or concrete foundation (diameter: 6.20 m)	Screw-in foundation or concrete foundation (diameter: 12.00 m)	Concrete foundation (diameter: 12.00 m (39.37 ft))			
Control system	astronomic programmable logic control = PLC (via time and date, incremental encoder, daily zero-point calculation) with 14-day programmable adjustment					
		backtracking to reduce shade				
Drive	planetary gear					
	brake motor 0.37 kW, i = 1:1,595, positive connection to anchor chain by chain wheel. Power consumption approx. 0.4 kWh/day					brake motor 0.75 kW, i = 1:1,639, positive connection to anchor chain by chain wheel. Power consumption approx. 0.6 kWh/day
Dead weight (steel structure, galvanised, without module)	4,500 kg	8,000 kg	10,000 kg	11,300 kg		12,900 kg
Building approval	compliant with Eurocode 1, subject to technical modifications	structural design check by experts with a calculated safety factor of at least 1.6 tested by the Bavarian State Testing Authority (LGA), CE certified				
Maximum ground level elevation	up to 400 m (1,312.34 ft) above sea level, compliant with Eurocode 1-EN1991-1-3: 2003 and UNI EN1991-1-3: 2004		up to 500 m (1,640.42 ft) above sea level SLZ I-III, compliant with DIN 1055 part 5 – 1975	up to 285 m (935.04 ft) above sea level, compliant with DIN 1055 part 5 – 2005	up to 1,000 m (3,280.84 ft) above sea level, compliant with Eurocode 1-EN1991-1-3:2003	
Area of use	open spaces from 25 to 55 degrees of latitude, northern or southern hemisphere					

SunCarrier 220 | 250 | 260 | 300

Maximum achievement even at rough climate

The SunCarrier is a single-axis tracking system, which permanently aligns the module surface through a vertical axis towards the current position of the sun. Accurate in tracking, secure and reliable. The SunCarrier was developed as a robust and low-maintenance solar tracking system. It has a foundation with a diameter of 12 meters which is form-locked to a steel structure with an anti-derailing device.

The readjustment to the current position of the sun occurs in ten minute intervals with repositioning taking only ten seconds.

For the SunCarrier 220/250/260/300 the pitch angle of the module surface is 30° towards the horizontal. Thus, the modules are always aligned precisely towards the sun. With a module surface area of up to 287.5 square meters (3,094.61 square feet), the SunCarrier provides an output of up to 53 kWp. The forces which bear upon the system are dissipated directly into the foundation via the enclosed case of the steel construction. The SunCarrier therefore guarantees durability against high wind speeds and continues to work at maximum output when other systems are deflected by the wind.



SunCarrier 120 | 160

High performance in small dimensions

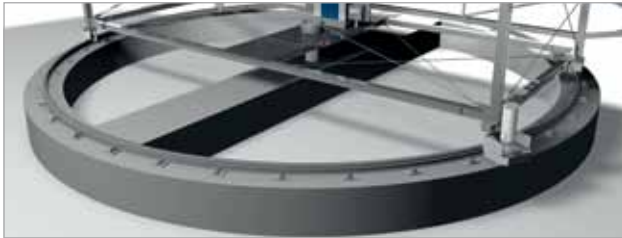
The SunCarrier 120 completes the portfolio as the smallest system and is based on the same technology as the SunCarrier 220/250/260/300. With a construction height of only 4.3 meters (14.11 feet), the SunCarrier 120 can be installed without any problem in countries with construction height limits. The module surface of approximately 120 square meters (1,287.15 square feet) makes it both the smallest and the most flexible SunCarrier. The lower construction height also means less wind load and the resulting development focus on lightweight construction allowed the weight of the steel construction to be significantly reduced. There is also the possibility to choose between concrete and screw-in foundation depending on the country-specific requirements and local ground conditions. The module surface of 120 square meters is aligned to track the sun at an angle of 30 degrees to the horizontal. Depending on the module used, an output of up to 24 kWp can be installed and an increased annual energy yield of up to 35 % compared to fixed systems can be achieved.

In terms of its height, the SunCarrier 160 completes our product portfolio as the smallest model. With a height of only 4 meters (13.12 feet) the SunCarrier 160 can be also installed without any problem in countries with construction height limits. Also the weight of the steel construction was managed to be significantly reduced. With a module surface of approximately 163 square meters (1,754.52 square feet) an output of up to 30 kWp can be achieved, depending on the module type installed. Due to its innovative geometry, solar modules can be mounted on the SunCarrier 160 at an angle of 40° to the horizontal. As a result an increased annual energy yield of up to 35 % in comparison to conventional market solutions can be achieved.



SunCarrier 160

Hard Facts



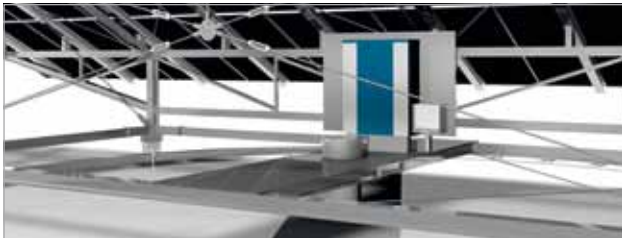
Foundation

The forces which bear upon the system are dissipated directly into the foundation via the enclosed case of the steel construction.



Rail system with anti-derailing device

The rail system has a diameter of twelve meters (39.37 feet) and is the rotational and crucial point of the construction. A massive anti-derailing device ensures that the SunCarrier cannot be lifted off the rails.



Accurate tracking

The SunCarrier has an astronomic programmable logic control system (PLC), which informs the drive motor to readjust the SunCarrier every ten minutes to the new position of the sun.



Drive

The rotation of the SunCarrier is delivered by an electric motor with brake function and a three stage planetary gear.



Steel structure

The mechanical steel structure of the SunCarrier is FEM analysed and manufactured from stable, galvanized maintenance-free steel.



Modules

The SunCarrier can be equipped with all common types of modules, horizontally or vertically, according to customer requirements.

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