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SunOyster in operation in Shuozhou, China

## Data Sheet



## Pilot Production Series of SunOyster 16 with Concentrator Cell Receiver

Note: Indicative data only. SunOyster Systems reserves the right to change specifications.

### Introduction

**The SunOyster 16** is a concentrating solar collector that produces both electricity and high grade heat from the one unit. Its 16 square meters of parabolic mirror track the sun, and concentrate the sun's energy on a receiver tube, achieving a total energy efficiency of up to 75%.

### Installation:

The base is installed on a horizontal surface using twelve steel feet to support the ring profile. The sub-structure can be ground anchors, concrete plates or steel beams (for more details see installation information sheet).

### Mechanics:

- Ring profile: Rail profile S7 in corten steel, 5.24 m diameter of the ring. Maximum swept diameter with mirrors folded: 8 m, corresponding to 50 m<sup>2</sup>.
- Main frame and other profiles: steel, hot-dip-galvanized or with highly corrosion resistant zinc-aluminum-magnesium (ZAM) coating.
- 2 semi-parabolic mirror troughs at a horizontal distance of 3 m from each other. Each with a width of 3970 mm and a height of 2000 mm. Concentration factor  $\geq 30 \times$ . Reflectors are mirrors using 4 mm toughened glass (approx. 95% reflectivity), with ceramic pads bonded on the reverse side for installation. Weight: Approx. 115 kg for the ring profile and 1100 kg for the SunOyster incl. inverter and solar fluid.

## Tracking: Two-axis in Azimuth and Elevation:

Azimuth tracking  $\geq 350^\circ$  rotation angle; gear motor.  
Elevation tracking working angle  $0^\circ$  to  $160^\circ$ ; individual drive system with worm gear for each mirror.

## Receiver: Hybrid Receiver for Co-generation of Electric and Thermal Power

### Electric Properties:

- High quality multi-layer concentrator cells with cell efficiency of up to 44 %.
- Electrical generator power: pilot production series 3.2 kW p and production series 4.7 kW p. <sup>1</sup>
- Temperature coefficient for power: -0.1 %/K.

### PV Inverter System:

- PV-inverter SMA Sunny Boy 4000TL.
- Efficiency (Euro): 96,4%
- Grid connection type: AC Single Phase (L / N / PE);
- Rated AC voltage: 230 V;
- Rated output frequency: 50 Hz / 60 Hz;
- Maximum external AC overcurrent protection: 25 A;
- Anti-islanding protection:  
According to local standards.

### Electric Interconnection:

Junction box with clamp terminals for the cable (wire size 2.5 mm<sup>2</sup>, 3 or 5 wires) positioned within 1 m from the center of the SunOyster.

### Control System:

- Customized and highly integrated control system with 3 independent motor controllers.
- Redundant safety system with integrated temperature switches in each receiver.
- Integrated UPS system for closing the SunOyster during main grid failure.
- Local or central weather station equipped with the following sensors:
  - Anemometer and
  - Radiation sensor.
- Power consumption: 10-20 W avg. (300 W peak).

## Data Interconnection:

Junction box with RJ45 ethernet port positioned within 1 m from the center of the SunOyster. Router with integrated DHCP server and 3 available ports (3 x RJ45). Cable: Minimum CAT. 5e. Speed: 100 Mbit/s.

## Thermal Properties:

- Thermal power: pilot production machine 6 kW and production machine 7.5 kW. <sup>2</sup>
- Heat transfer medium in areas without freezing temperatures: De-mineralized water. In other areas: solar fluid, i.e. water with corrosion protection additives. Standard version max. temperature of working fluid: 105°C. High temperature version up to 170°C.
- System pressure: min. 3 bar (2 bar gauge pressure) and max. 7 bar (6 bar gauge pressure) for standard version, for high temperature version up to 16 bar.
- Flow Rate: Minimum flow of 250 l/h, at full radiation 750 l/h, maximum flow 1,500 l/h.
- Pressure loss:  $\leq 0.5$ bar at 1,500 l/h.

## Thermal Interconnection:

Pipes for the hot fluid should be installed to within a distance of 1 m from the center of the SunOyster. Stainless steel pipes are preferred. The pipes should have a minimum inner diameter of 25mm (1 inch) – preferably larger for long runs. The two ends should be 300 mm apart, and have a 1 inch external pipe thread.

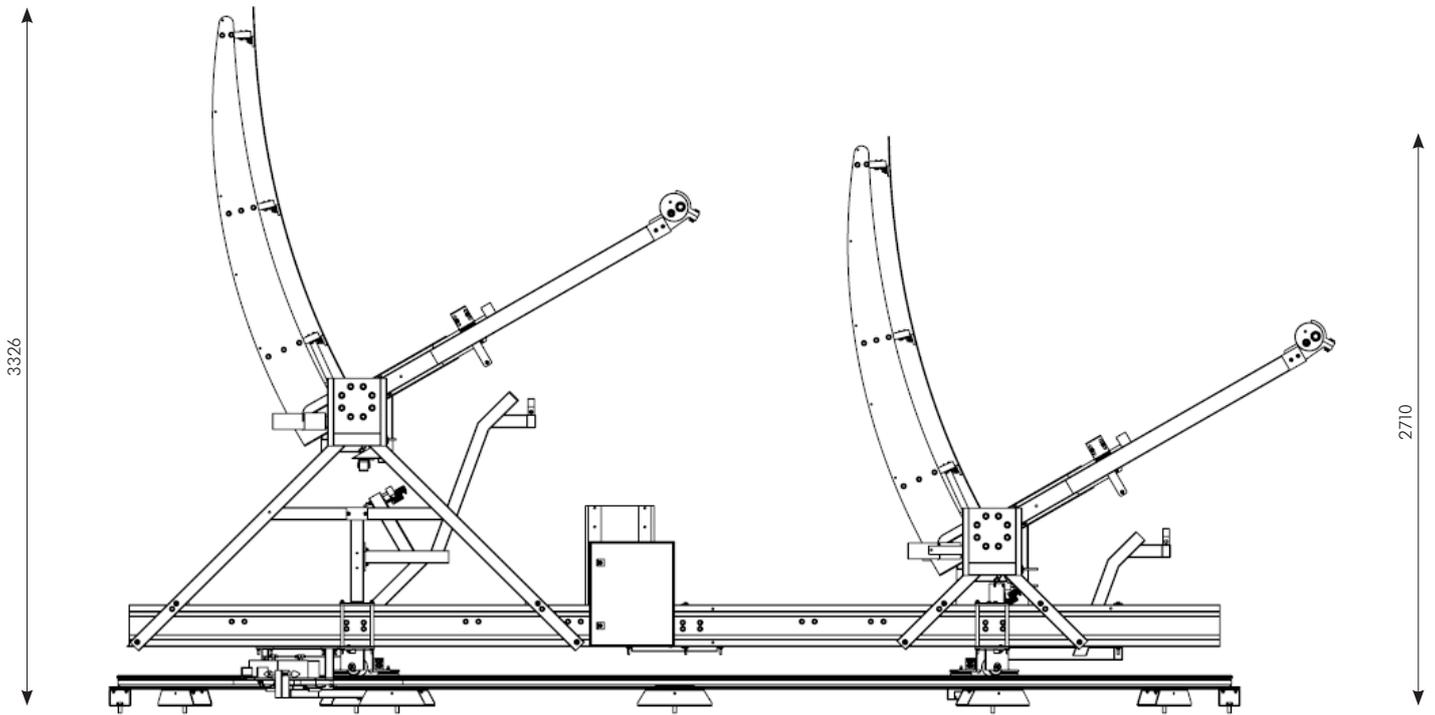
## Operational limits:

- Ambient Temperature range:  $-40^\circ\text{C}$  to  $+50^\circ\text{C}$ .
- Air humidity: 0-100%, condensing.
- Wind: normal operation up to 55 km/h.  
In safety position up to 150 km/h.
- Snow: German load zone 2.

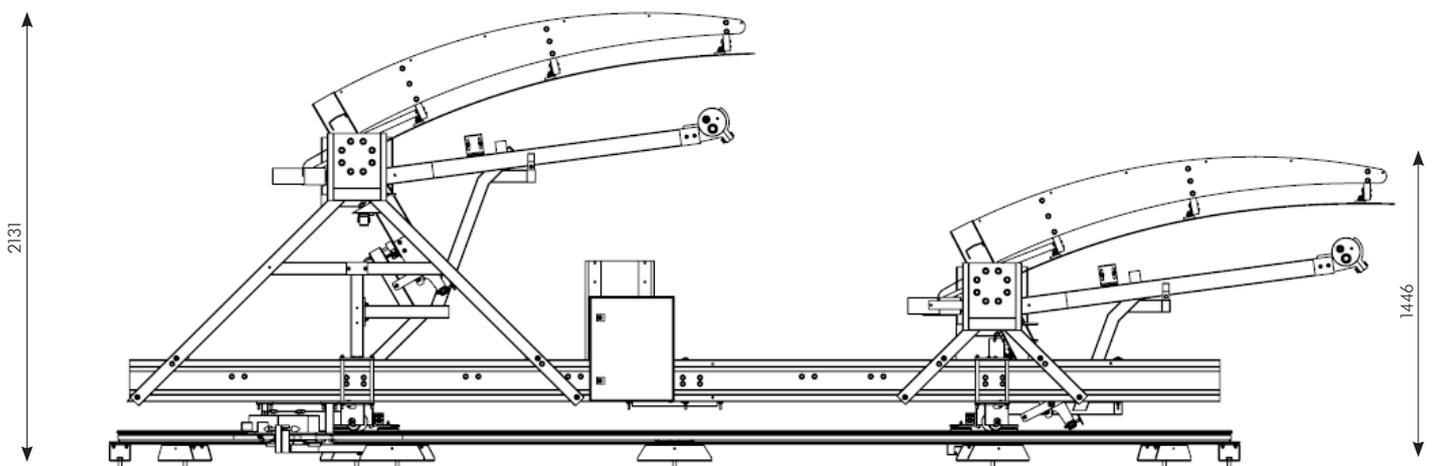
<sup>1, 2</sup> Nominal power of generator under Concentrator Standard Test Conditions CSTC acc. IEC 62670-1:2013:1.000W/m<sup>2</sup>, (25±2)°C, AM 1,5 acc. EN 60904-3



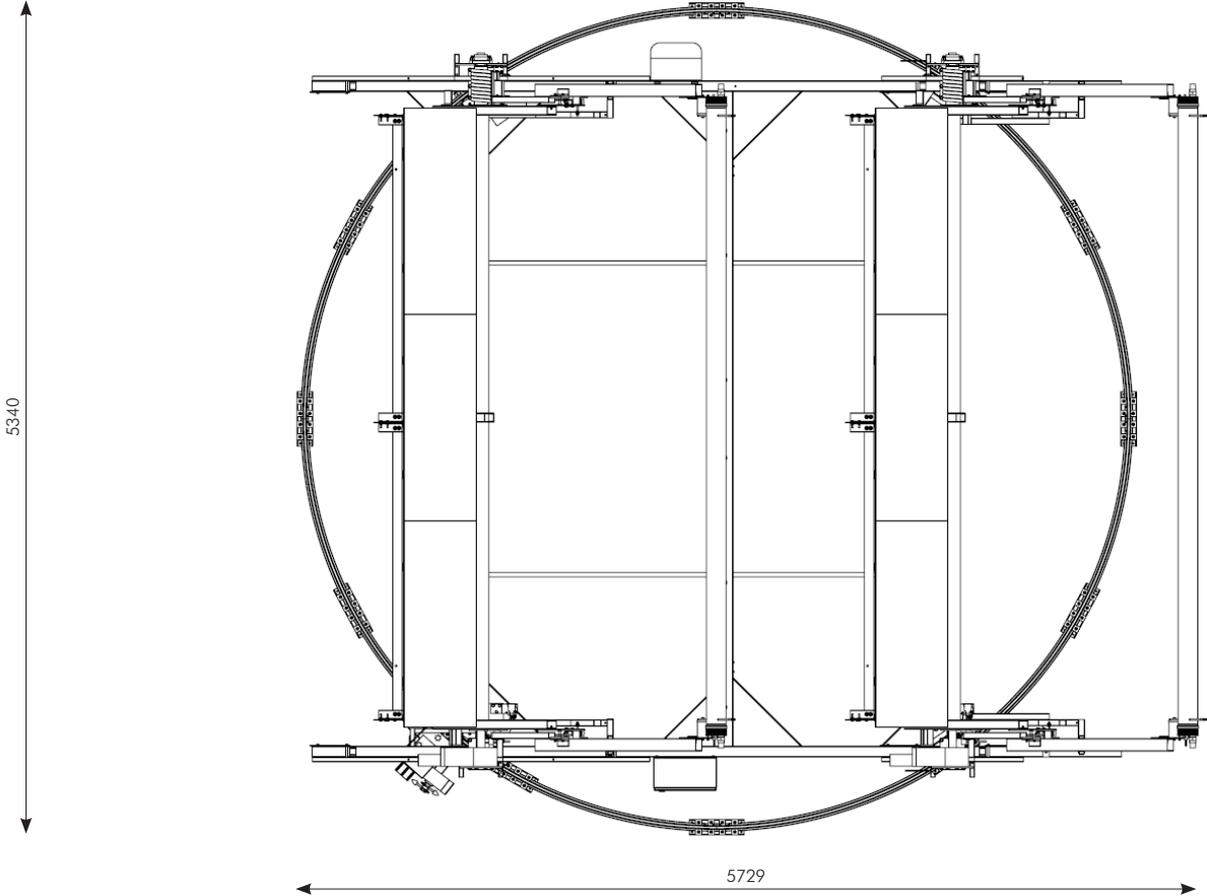
### SunOyster 16 side view open:



### SunOyster 16 side view closed:



SunOyster 16 top view open:



SunOyster 16 top view closed:

