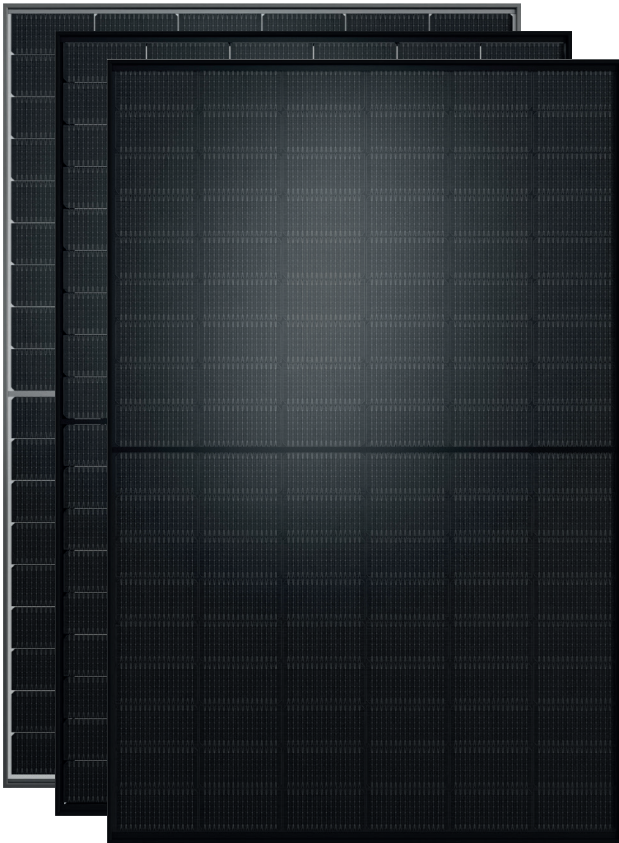


PRODUCT



SOLARWATT Panel

vision M 5.0 style
vision M 5.0 black
vision M 5.0 pure

Glass-Glass-Module

Solid quality with high performance

Thanks to their design Solarwatt glass-glass modules deliver the highest long-term yields. They are robust and resilient. Bifacial TOPCon half-cut-cells enable modules that are optimized for maximum performance.

The solar cells are embedded almost indestructibly in the glass-glass composite and thus optimally protected against all weather effects and mechanical stress. Solarwatt can therefore offer a 30-year warranty on performance and product quality.

The Solarwatt FullCoverage insurance is included for 5 years and free of charge. It insures almost all risks and takes effect even if the modules do not produce electricity or deliver less than expected in the event of damage.



SUSTAINABILITY



low CO₂ footprint
< 220 kg eq CO₂ / Modul*, 50% less CO₂ than standard modules and certified according to PPE2 criteria



fair production conditions
no forced or child labour, fair pay and regular audits by independent audits by independent experts



high recycling rate in raw materials
aluminum: 75 %, cell silicium: 45 %
sustainable use through maximum durability and recycling at the end of the product life cycle

* Specification without frame, with frame: < 240 kg eq CO₂/module

PRODUCT QUALITY

- performance: 440 Wp to 450 Wp
- bifacial TOPCon half-cut-cells
- LeTID tested and PID protected
- ammonia resistant
- salt mist resistant

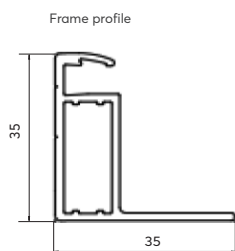
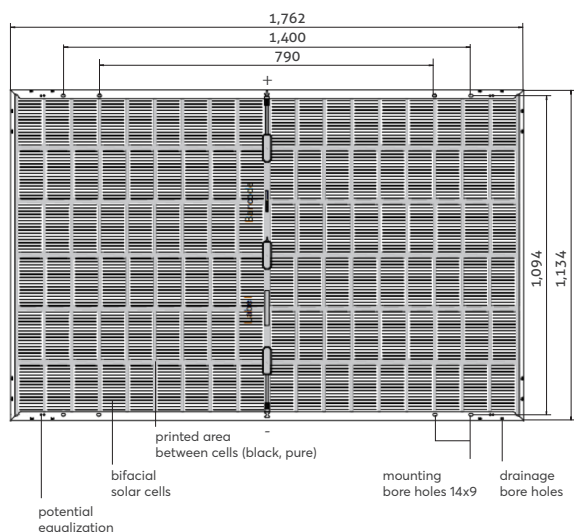
SERVICE

simple returns policy
as per „Delivery terms for Solarwatt solar modules“

30 year product warranty
as per „Warranty conditions for SOLARWATT Panel vision“

30 year performance warranty
on 90 % of nominal power as per „Warranty conditions for SOLARWATT Panel vision“

DIMENSIONS



GENERAL DATA

| | |
|--|--|
| Module technology | Glass-glass laminate; aluminum frame black (style, black) or silver (pure) |
| Covering material | Tempered solar glass with anti-reflective finish, 2 mm |
| Encapsulation | Solar cells in POE encapsulation |
| Backing material | Tempered glass, transparent (style) or partially printed (spaces between the cells) in black (black) or white (pure), 2 mm |
| Solar cells | 108 monocrystalline, bifacial, high power TOPCon-solar cells |
| Cell dimensions | 182 x 93 mm |
| L x W x H / Weight | 1,762 ^{±2} x 1,134 ^{±2} x 35 ^{±0.3} mm / 24.8 kg |
| Connection technology | Cables 2x 1.2 m / 4 mm ² Stäubli Electrical MC4-Evo 2 connectors |
| Bypass diodes | 3 |
| Max. system voltage | 1,500 V |
| IP rating | IP68 |
| Protection class | II (acc. to IEC 61140) |
| Fire class | C (acc. to IEC 61730/UL 790) in preparation: A (acc. to IEC 61730/UL 790) |
| Certified mechanical ratings as per IEC 61215 | in preparation: Pressure load up to 5,400 Pa (test load 8,100 Pa) Suction load up to 3,600 Pa (test load 5,400 Pa) |
| Qualifications | in preparation: IEC 61215 (incl. LeTID) IEC 61730 PID IEC TS 62804 IEC 61701 IEC 62716 |

ELECTRICAL DATA (STC)

STC (Standard Test Conditions): Irradiation intensity 1,000 W/m², spectral distribution AM 1.5 | Temperature 25 ±2 °C, in accordance to EN 60904-3

Please check the performance class availability!

| | | | |
|---|--------------------|--------------------|--------------------|
| Nominal power P_{max} | 440 W _p | 445 W _p | 450 W _p |
| Nominal voltage V_{mp} | 32.8 V | 33.0 V | 33.2 V |
| Nominal current I_{mp} | 13.4 A | 13.5 A | 13.5 A |
| Open circuit voltage V_{oc} | 39.4 V | 39.6 V | 39.8 V |
| Short circuit current I_{sc} | 13.9 A | 14.0 A | 14.0 A |
| Module efficiency | 22.0 % | 22.3 % | 22.5 % |

Measurement tolerances: P_{max} ±5 %; V_{OC} ±3 %; I_{SC} ±3 %, I_{MP} ±10 %

Reverse-current power rating IR: 30 A, operating modules with an external power source is only permissible if using a phase fuse with a tripping current of ≤ 30 A.

THERMAL FEATURES

| | |
|--|----------------|
| Operating temperature range | -40 ... +85 °C |
| Ambient temperature range | -40 ... +45 °C |
| Temperature coefficient P_{max} | -0.29 %/K |
| Temperature coefficient V_{oc} | -0.25 %/K |
| Temperature coefficient I_{sc} | 0.05 %/K |
| NMOT | 42 °C |

ELECTRICAL DATA (WEAK LIGHT AND BNPI)

Weak light conditions: Irradiation intensity 200 W/m², Temperature 25 °C, Wind speed 1 m/s, load operation

BNPI: Bifacial Nameplate Irradiance G = 1000 W/m² + φ * 135 W/m²
φ = MIN (φ_{ISC}, φ_{Pmax}), φ_{ISC} = 80 %, φ_{VOC} = 100 %, φ_{Pmax} = 80 %

| | | | |
|--|--------|--------|--------|
| Nominal power P_{max@STC} | 440 W | 445 W | 450 W |
| Nominal power P_{max@200 W/m²} | 86.2 W | 87.1 W | 88.3 W |
| Nominal power P_{max@BNPI} | 457 W | 490 W | 495 W |
| Open circuit voltage V_{OC@BNPI} | 39.5 V | 39.7 V | 39.9 V |
| Short circuit current I_{SC@BNPI} | 15.3 A | 15.4 A | 15.4 A |

Measurement tolerances: P_{max} ±5 %; V_{OC} ±3 %; I_{SC} ±3 %, I_{MP} ±10 %

Reduction of module efficiency when irradiance is reduced from 1,000 W/m² to 200 W/m² (at 25 °C): 4±2 % (relative) / -0.6±0.3 % (absolute).

TRANSPORT AND PACKAGING

| | |
|---|-----------------------|
| Modules per pallet | 31 |
| Pallets per container | 26 |
| Stacked pallets/pallets per truck | 14 / 28 |
| Gross weight per pallet | 809 kg |
| Gross weight per stacked pallet (max. 2) | 1,618 kg |
| Pallet dimensions (packing size) | 1,800 x 1,140 x 1,250 |