

## PRODUCT



# SOLARWATT Panel vision M 5.0 style

## 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 CO<sub>2</sub> footprint**  
< 220 kg eq CO<sub>2</sub> / Modul\*, 50% less CO<sub>2</sub> than standard modules and certified according to PPE2 criteria



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



**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 CO<sub>2</sub>/module

## PRODUCT QUALITY

- performance: 440 Wp to 455 Wp
- bifacial TOPCon half-cut-cells
- LeTID tested and PID protected
- ammonia resistant
- salt mist resistant
- intensive hailstorm 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

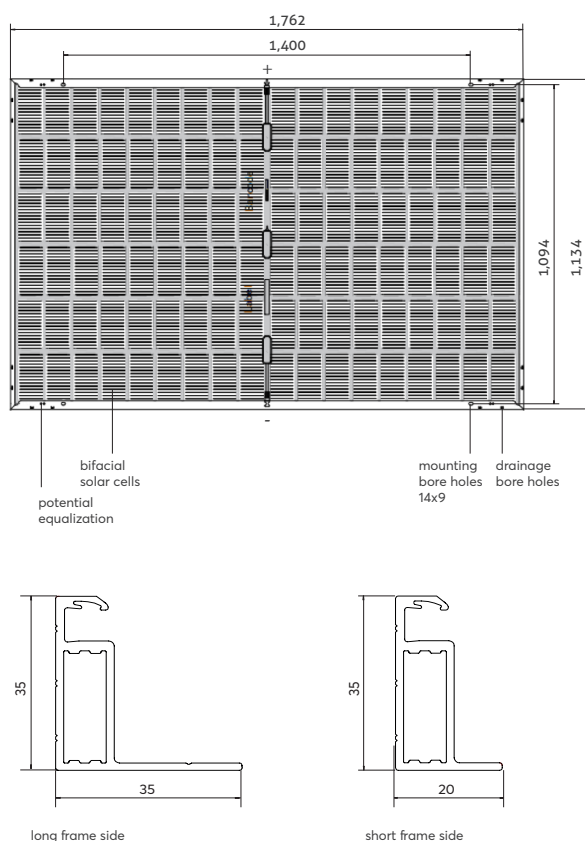
on 90 % of nominal power as per „Warranty conditions for SOLARWATT Panel vision“

**Subject to change | Errors excepted.**

This datasheet fullfills the requirements listed in IEC 61215-1-1 | EN

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Certified acc. to DIN EN ISO 9001, 14001, 45001, 50001

## DIMENSIONS



## GENERAL DATA

<b>Module technology</b>	Glass-glass laminate; aluminum frame black (style, black) or silver (pure)
<b>Covering material</b>	Tempered solar glass with anti-reflective finish, 2 mm
<b>Encapsulation</b>	Solar cells in POE encapsulation
<b>Backing material</b>	Tempered glass, transparent (spaces between the cells), 2 mm
<b>Solar cells</b>	108 monocrystalline, bifacial, high power TOPCon-solar cells
<b>Cell dimensions</b>	182 x 93 mm
<b>L x W x H / Weight</b>	1,762 <sup>±2</sup> x 1,134 <sup>±2</sup> x 35 <sup>±0.3</sup> mm / 24.8 kg
<b>Connection technology</b>	Cables 2x 1.2 m / 4 mm <sup>2</sup> Stäubli Electrical MC4-Evo 2 connectors
<b>Bypass diodes</b>	3
<b>Max. system voltage</b>	1,500 V
<b>IP rating</b>	IP68
<b>Protection class</b>	II (acc. to IEC 61140)
<b>Fire class</b>	A (acc. to IEC 61730/UL 790) B <sub>ROOF</sub> (t1) (acc. to EN13501-5)
<b>Certified mechanical ratings as per IEC 61215</b>	Pressure load up to 5,400 Pa (test load 8,100 Pa) Suction load up to 2,400 Pa (test load 3,600 Pa)
<b>Qualifications</b>	IEC 61215 (incl. LeTID)   IEC 61730 PID IEC TS 62804   IEC 61701   IEC 62716 hail resistance class HW 3

## ELECTRICAL DATA (STC)

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

Please check the performance class availability!

	440 Wp	445 Wp	450 Wp	455 Wp
<b>Nominal power P<sub>max</sub></b>	440 Wp	445 Wp	450 Wp	455 Wp
<b>Nominal voltage V<sub>mp</sub></b>	32.8 V	33.0 V	33.2 V	33.4 V
<b>Nominal current I<sub>mp</sub></b>	13.4 A	13.5 A	13.5 A	13.6 A
<b>Open circuit voltage V<sub>oc</sub></b>	39.4 V	39.6 V	39.8 V	40.0 V
<b>Short circuit current I<sub>sc</sub></b>	13.9 A	14.0 A	14.0 A	14.1 A
<b>Module efficiency</b>	22.0 %	22.3 %	22.5 %	22.8 %

Measurement tolerances: P<sub>max</sub> ±5 %; V<sub>OC</sub> ±3 %; I<sub>SC</sub> ±3 %, I<sub>MP</sub> ±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

<b>Operating temperature range</b>	-40 ... +85 °C
<b>Ambient temperature range</b>	-40 ... +45 °C
<b>Temperature coefficient P<sub>max</sub></b>	-0.29 %/K
<b>Temperature coefficient V<sub>oc</sub></b>	-0.25 %/K
<b>Temperature coefficient I<sub>sc</sub></b>	0.05 %/K
<b>NMOT</b>	42 °C

## ELECTRICAL DATA (WEAK LIGHT AND BNPI)

Weak light conditions: Irradiation intensity 200 W/m<sup>2</sup>, Temperature 25 °C, Wind speed 1 m/s, load operation

BNPI: Bifacial Nameplate Irradiance G = 1000 W/m<sup>2</sup> + φ \* 135 W/m<sup>2</sup>  
φ = MIN (φ<sub>ISC</sub>, φ<sub>Pmax</sub>), φ<sub>ISC</sub> = 80 %, φ<sub>VOC</sub> = 100 %, φ<sub>Pmax</sub> = 80 %

	440 W	445 W	450 W	455 W
<b>Nominal power P<sub>max@STC</sub></b>	440 W	445 W	450 W	455 W
<b>Nominal power P<sub>max@200 W/m²</sub></b>	86.2 W	87.2 W	88.2 W	89.2 W
<b>Nominal power P<sub>max@BNPI</sub></b>	485 W	490 W	496 W	501 W
<b>Open circuit voltage V<sub>OC@BNPI</sub></b>	39.5 V	39.7 V	39.9 V	40.1 V
<b>Short circuit current I<sub>SC@BNPI</sub></b>	15.3 A	15.4 A	15.4 A	15.5 A

Measurement tolerances: P<sub>max</sub> ±5 %; V<sub>OC</sub> ±3 %; I<sub>SC</sub> ±3 %, I<sub>MP</sub> ±10 %

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

## TRANSPORT AND PACKAGING

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