



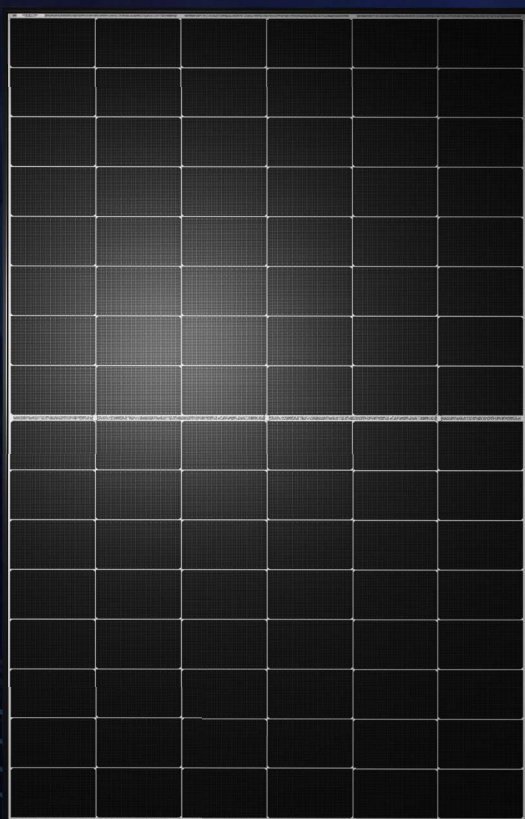
# Heckert Solar

FUTURE STARTS IN GERMANY



## ZEUS 1.1 white

N-Type glass-glass-module  
450-460WP



LATEST TECHNOLOGY



ATTRACTIVE DESIGN



MODULE POWER UP TO 460WP



MODULE EFFICIENCY UP TO 23%

**DE**

GERMAN  
WARRANTOR



DIRECT  
SERVICE

**30  
YEARS**

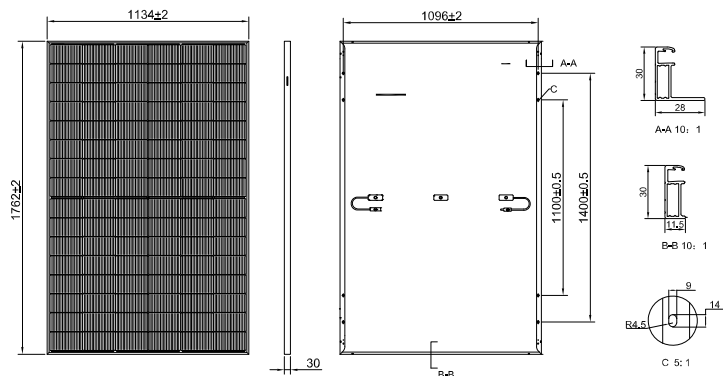
PRODUCT  
WARRANTY

**30  
YEARS**

PERFORMANCE  
WARRANTY

# ZEUS 1.1 450-460WP WHITE

## DIMENSIONS IN MM



## ELECTRICAL SPECIFICATIONS<sup>1</sup> (STC<sup>2</sup>)

|                                    |       |       |       |
|------------------------------------|-------|-------|-------|
| Rated Power $P_{MPP}$ (Wp)         | 450   | 455   | 460   |
| Max. Power Current $I_{MPP}$ (A)   | 14,93 | 14,95 | 14,97 |
| Max. Power Voltage $V_{MPP}$ (V)   | 30,15 | 30,44 | 30,73 |
| Short-circuit Current $I_{SC}$ (A) | 15,84 | 15,89 | 15,94 |
| Open-circuit Voltage $V_{OC}$ (V)  | 35,95 | 36,10 | 36,25 |
| Module Efficiency (%)              | 22,5  | 22,8  | 23,0  |

## ELECTRICAL SPECIFICATIONS<sup>1</sup> (NMOT<sup>3</sup>)

|                                    |       |       |       |
|------------------------------------|-------|-------|-------|
| Rated Power $P_{MPP}$ (Wp)         | 340   | 344   | 347   |
| Max. Power Current $I_{MPP}$ (A)   | 12,05 | 12,07 | 12,09 |
| Max. Power Voltage $V_{MPP}$ (V)   | 28,22 | 28,51 | 28,71 |
| Short-circuit Current $I_{SC}$ (A) | 12,79 | 12,83 | 12,87 |
| Open-circuit Voltage $V_{OC}$ (V)  | 34,22 | 34,37 | 34,51 |

## TEMPERATURE CHARACTERISTICS

|                                                   |          |
|---------------------------------------------------|----------|
| Nominal Module Operating Temperature <sup>3</sup> | 45 ± 2°C |
| Temperature Coefficient $P_{MAX}$ (%/°C)          | - 0,28   |
| Temperature Coefficient $V_{OC}$ (%/°C)           | - 0,24   |
| Temperature Coefficient $I_{SC}$ (%/°C)           | + 0,046  |

## OPERATING CONDITIONS

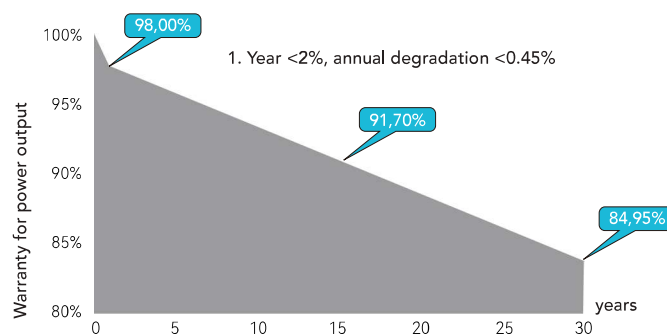
|                                  |             |
|----------------------------------|-------------|
| Operation Temperature Range      | -40 ~ +85°C |
| Max. System Voltage (VDC)        | 1500        |
| Reverse Current Feed $I_R$ (A)   | 30          |
| Power Performance Tolerance (Wp) | 0 / +4,99   |

Measurements according to IEC 60904-3, measurements tolerance:  $I_{SC}$  ±5%,  $V_{OC}$  ±5%,  $P_{MPP}$  +/−4%, bifaciality: 80% ± 5%, <sup>2</sup>Standard Test Conditions STC: irradiation 1.000 W/m<sup>2</sup> with a spectrum of AM 1,5 at a cell temperature of 25°C. Maximum reduction in efficiency at 200W/m<sup>2</sup>: 2%. <sup>3</sup>NMOT-Data: Nominal Module Operating Temperature at irradiation of 800W/m<sup>2</sup> and an ambient temperature of 20 °C. Operation temperature range between -40°C and +85°C. All dimensions +/−3mm. Technical specifications subject to changes. No liability is assumed for particulars. Please follow our installations instructions.

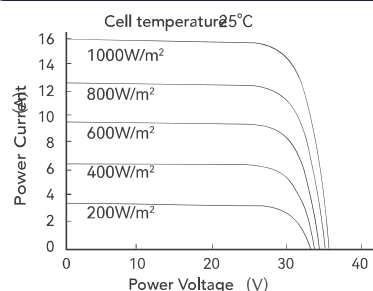
## MODULE SPECIFICATIONS

|                             |                                              |
|-----------------------------|----------------------------------------------|
| Cell Technology             | G12R n-type monocrystalline, TOPCon          |
| Cells                       | 96 half cut cells                            |
| Dimensions                  | 1762±2 x 1134±2 x 30mm                       |
| Weight                      | 23,7kg                                       |
| Front Glass                 | 2mm partially heat strengthened AR-glass     |
| Rear Glass                  | 2mm partially heat strengthened glass        |
| Frame                       | 30mm black anodized aluminium frame          |
| Junction Box                | 3 diodes, IP68, according to IEC 62790       |
| Connecting Cable            | 4mm <sup>2</sup> /Stäubli MC4-EVO 2A (1500V) |
| Cable Length                | 2 x 1200mm                                   |
| Max. Test-Load, push/pull   | 8100Pa / 2400Pa                              |
| Max. Design-Load, push/pull | 5400Pa / 1600Pa                              |

## LINEAR POWER OUTPUT WARRANTY



## I-V CURVE



## CERTIFICATES & WARRANTIES

IEC 61215, IEC 61730  
 IEC 62716: Ammonia Corrosion  
 IEC 61701: Salt Mist Corrosion  
 IEC 62804: PID  
 IEC 60068-2-68: Dust & Sand  
 Fire Protection Class: A (according to UL 790)  
 Hail Resistance Class: HW4  
 Product Warranty: 30 years  
 Performance Warranty: 30 years  
 WEEE-Reg.-No.: DE 42676826  
 36 Modules/Palettes, 936 Modules/40'HC

