



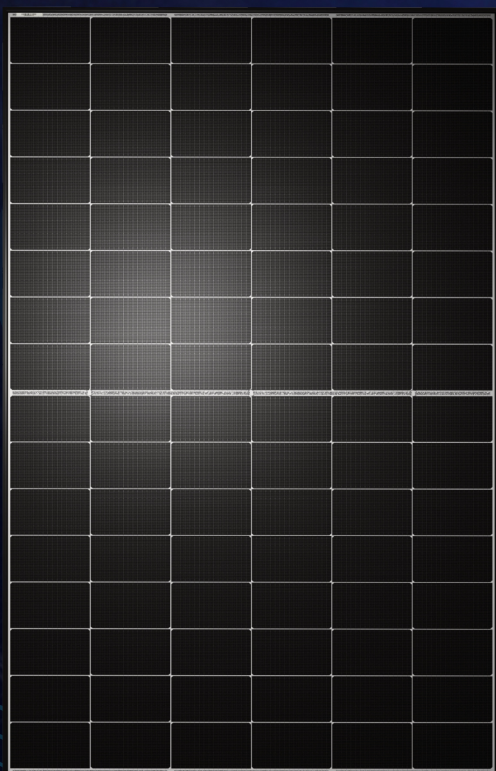
Heckert Solar

FUTURE STARTS IN GERMANY



ZEUS 1.1 White grid

N-Type Bifacial glass-glass-module
450-455WP



LATEST TECHNOLOGY



ATTRACTIVE DESIGN



MODULE POWER UP TO 455WP



MODULE EFFICIENCY UP TO 22,8%

DE

GERMAN
WARRANTOR



DIRECT
SERVICE

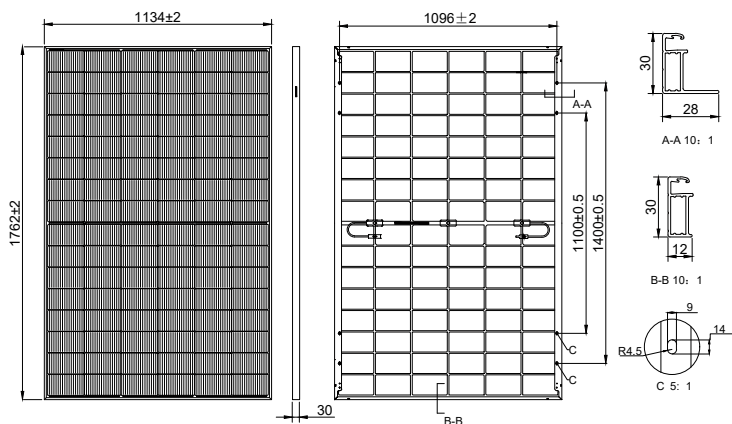
30
YEARS

PRODUCT
WARRANTY

30
YEARS

PERFORMANCE
WARRANTY

DIMENSIONS IN MM



ELECTRICAL SPECIFICATIONS¹ (STC²)

Rated Power P_{MPP} (Wp)	450	455
Max. Power Current I_{MPP} (A)	14,91	14,95
Max. Power Voltage V_{MPP} (V)	30,19	30,44
Short-circuit Current I_{SC} (A)	15,95	15,98
Open-circuit Voltage V_{OC} (V)	35,75	35,95
Module Efficiency (%)	22,5	22,8

ELECTRICAL SPECIFICATIONS¹ (NMOT³)

Rated Power P_{MPP} (Wp)	340	344
Max. Power Current I_{MPP} (A)	12,04	12,07
Max. Power Voltage V_{MPP} (V)	28,24	28,51
Short-circuit Current I_{SC} (A)	12,88	12,90
Open-circuit Voltage V_{OC} (V)	33,03	34,22

BIFACIAL OUTPUT (STC)

5% P_{max} (Wp)	472	477
15% P_{max} (Wp)	517	523
25% P_{max} (Wp)	562	568

TEMPERATURE CHARACTERISTICS

Nominal Module Operating Temperature ³	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

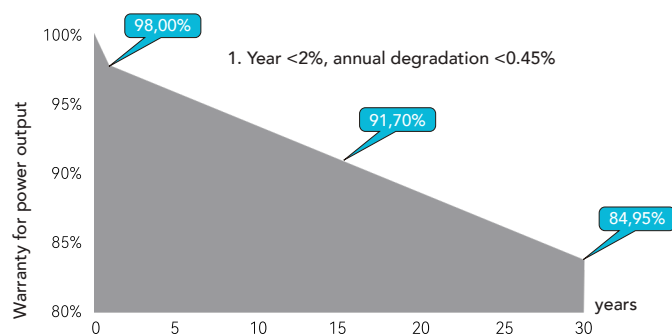
Operation Temperature Range	-40 ~ +85°C
Max. System Voltage (VDC)	1500
Reverse Current Feed I_R (A)	30
Power Performance Tolerance (Wp)	0 / +4,99
Max. Bifaciality (%)	80 ± 5

¹Measurements according to IEC 60904-3, measurements tolerance: I_{SC} ±5%, V_{OC} ±5%, P_{MPP} ±4%, bifaciality: 80% ± 5%, ²Standard Test Conditions STC: irradiation 1.000 W/m² with a spectrum of AM 1.5 at a cell temperature of 25°C. Maximum reduction in efficiency at 200W/m²: 2%. ³NMOT-Data: Nominal Module Operating Temperature at irradiation of 800W/m² 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.

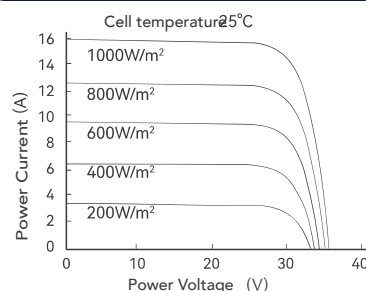
MODULE SPECIFICATIONS

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	2,0mm partially heat strengthened AR-glass
Rear Glass	2,0mm partially heat strengthened glass
Frame	30mm black anodized aluminium frame
Junction Box	3 diodes, IP68, according to IEC 62790
Connecting Cable	4mm ² Stäubli MC4-EVO 2A Stecker +/- (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

