



Heckert Solar

FUTURE STARTS IN GERMANY



ZEUS 1.0

Transparent
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

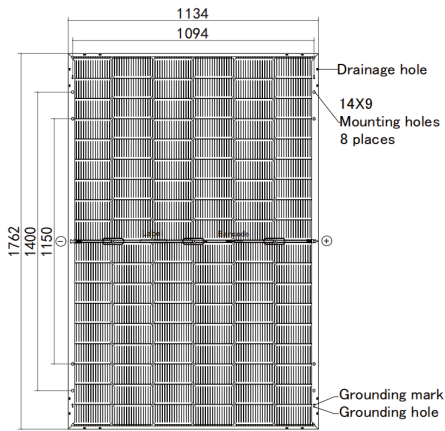
30
YEARS

PRODUCT
WARRANTY

30
YEARS

PERFORMANCE
WARRANTY

DIMENSIONS IN MM



MODULE SPECIFICATIONS

Cell Technology	M10 n-type monocrystalline, TOPCon
Cell Type	108 half cut cells
Dimensions	1762 x 1134 x 30mm
Weight	24,5kg
Front Glass	2mm heat strengthened AR-glass
Rear Glass	2mm 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 connector +/- (1500V)
Cable Length	2 x 1200mm
Max.Test-Load, push/pull	8100Pa / 3000Pa
Max.Design-Load, push/pull	5400Pa / 2000Pa

ELECTRICAL SPECIFICATIONS¹ (STC²)

Rated Power P_{MPP} (Wp)	450	455
Max. Power Current I_{MPP} (A)	13,27	13,35
Max. Power Voltage V_{MPP} (V)	33,91	34,11
Short-circuit Current I_{SC} (A)	14,17	14,24
Open-circuit Voltage V_{OC} (V)	40,25	40,45
Module Efficiency (%)	22,5	22,8

ELECTRICAL SPECIFICATIONS¹ (NMOT³)

Rated Power P_{MPP} (Wp)	339	343
Max. Power Current I_{MPP} (A)	10,73	10,79
Max. Power Voltage V_{MPP} (V)	31,68	31,86
Short-circuit Current I_{SC} (A)	11,41	11,47
Open-circuit Voltage V_{OC} (V)	38,13	38,32

ELECTRICAL SPECIFICATIONS¹ (BNPI⁴)

Rated Power P_{MPP} (Wp)	440	455
Max. Performance P_{MAX} (Wp)	497	503
Max. Power Current I_{MPP} (A)	14,64	14,72
Max. Power Voltage V_{MPP} (V)	33,95	34,15
Short-circuit Current I_{SC} (A)	15,59	15,67
Open-circuit Voltage V_{OC} (V)	40,25	40,45

TEMPERATURE CHARACTERISTICS

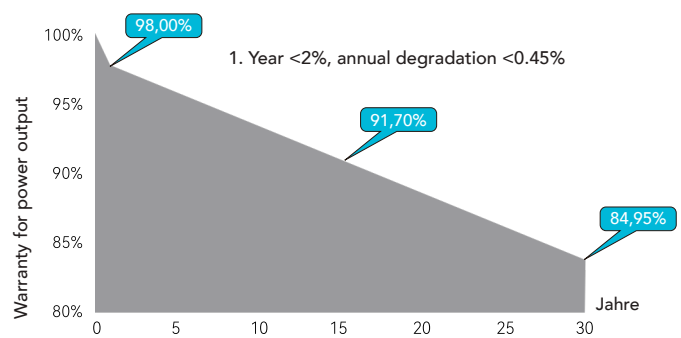
Nominal Module Operating Temperature ³	42 ± 2°C
Temperature Coefficient P_{MAX} (%/°C)	- 0,29
Temperature Coefficient V_{OC} (%/°C)	- 0,25
Temperature Coefficient I_{SC} (%/°C)	+ 0,048

OPERATING CONDITIONS

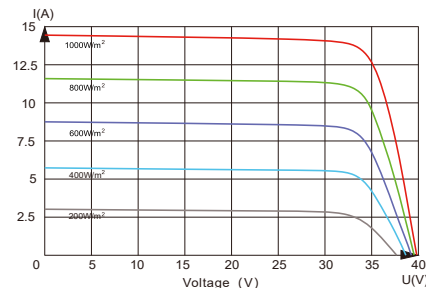
Operating temperature	-40 ~ +85°C
Max. System Voltage (VDC)	1500
Reverse current I_R (A)	30
Max. power tolerance (Wp)	0 / +4,99
Maximum bifaciality (%)	80 ± 5

¹Measurements according to IEC 60904-3, measurements tolerance: I_{SC} ±4%, V_{OC} ±4%, 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.

LINEAR POWER OUTPUT WARRANTY



I-V CURVE



CERTIFICATES & WARRANTIES

IEC 61215, IEC 61730
 IEC 62716: Ammonia Corrosion
 IEC 61701: Salt Mist Corrosion
 IEC TS 62804: PID; IEC TS 63342: LeTID
 IEC 60068: Dust & Sand
 Fire protection class: A (according to UL 790)
 Hail resistance class: HW3
 Product warranty: 30 years
 Performance warranty: 30 years
 WEEE-Reg.-No.: DE 42676826

36 modules/pallettes, 936 modules/40'HC

