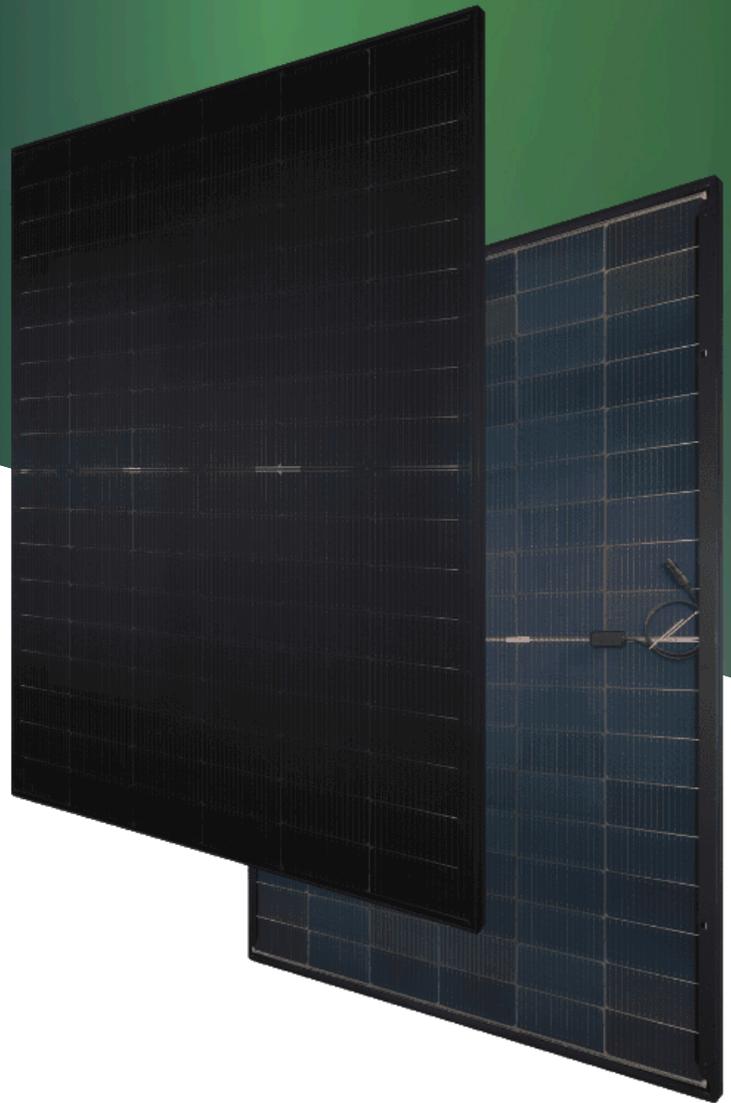


# LIMITLESS ULTRA 450W

High Efficiency N-TOPCon Bifacial Module



Bifacial technology enables additional energy harvesting from rear side (up to 30%).



30 year lifespan brings 10-30% additional power generation compared to conventional P-type modules.



N-type solar cells naturally don't have LID, which increases power generation.



Excellent low irradiance performance.



100% triple EL test enabling remarkable reduction of hidden crack rate of modules.



Industry leading lowest thermal coefficient of power.

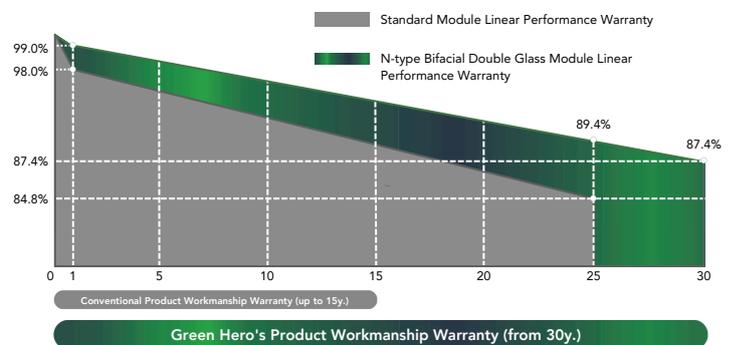


Optimized electrical design and lower operating current for reduced hot spot loss and better temperature coefficient.

IEC6215(2016), IEC61730(2016)  
ISO9001:2016: Quality Management System  
ISO45001:2018:  
Occupational health and safety management systems



## LINEAR PERFORMANCE WARRANTY



**30** years

Product Workmanship Warranty

**30** years

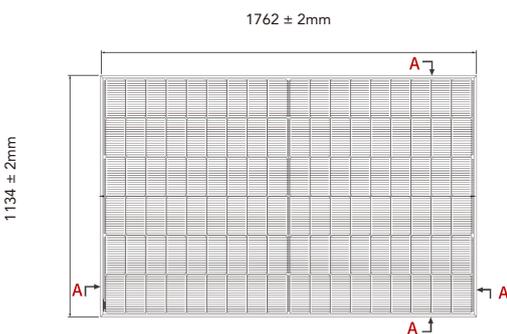
Output Power Warranty

Maximum Power (P <sub>MAX</sub> )	430	435	440	445	450
Maximum Voltage V <sub>MP</sub> (V)	33.08	33.26	33.44	33.61	33.79
Maximum Current I <sub>MP</sub> (A)	13.00	13.08	13.16	13.24	13.32
Open-Circuit Voltage V <sub>OC</sub> (V)	39.43	39.63	39.83	40.03	40.23
Short-Circuit Current I <sub>SC</sub> (A)	13.84	13.91	13.98	14.05	14.12
Module Efficiency STC (%)	21.52	21.77	22.02	22.27	22.52
Power Tolerance	0 ~ +3%				
Temperature Coefficient (P <sub>MAX</sub> )	-0.29%/°C				
Temperature Coefficient (V <sub>OC</sub> )	-0.25%/°C				
Temperature Coefficient (I <sub>SC</sub> )	+0.045%/°C				

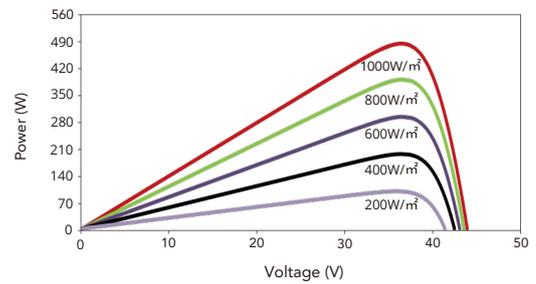
Cell Type	N-Type Monocrystalline
Number of Cells	108
Dimensions	1762x1134x30mm
Weight	24.5kg
Front Glass/Back Glass	2.0mm Anti Reflection Coating 2.0mm Heat Strengthened Glass
Frame Type	Anodized Aluminium Alloy
Junction Box	IP68 Rated
Protection Class	Class II
IEC Fire Type/Connector Type	MC4 Compatible/MC4 - Class A
Output Cables	4.0mm <sup>2</sup> , 1100mm(+) / 1100mm(-) or Customized Length

Pallet Dimensions	1792x1140x1249mm
Packing Details (Two pallets = One stack)	36 pcs/pallet, 72 pcs/stack, 936 pcs/40'HQ Container

Operating Temperature	-40°C ~ +70°C
Maximum System Voltage	1500 VDC (IEC)
Maximum Series Fuse Rating	30A



Power-Voltage Curves (440W)



Current-Voltage Curves (440W)

