



Beam N DUAL GLASS Solar Panel

450-470W

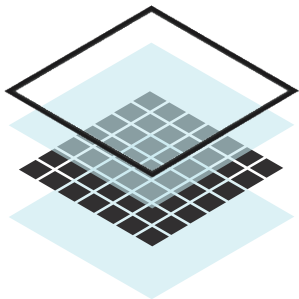
Bifacial - Black Frame (182mm)

N-Type Half Cell Module

ENSP60NBT2450BF ENSP60NBT2465BF
ENSP60NBT2455BF ENSP60NBT2470BF
ENSP60NBT2460BF



Built using N-Type Dual Glass technology, the Energizer® Solar Panels range combine two of the best technologies in the market.



Dual Glass Construction

- Panel Frame
- Front Glass Panel
- Solar Cells
- Rear Glass Panel



Dual glass technology



Lower operating temperatures



Improved fire & water resistance



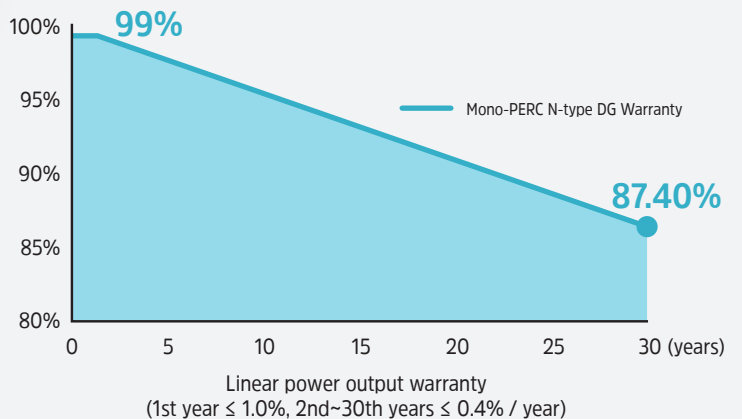
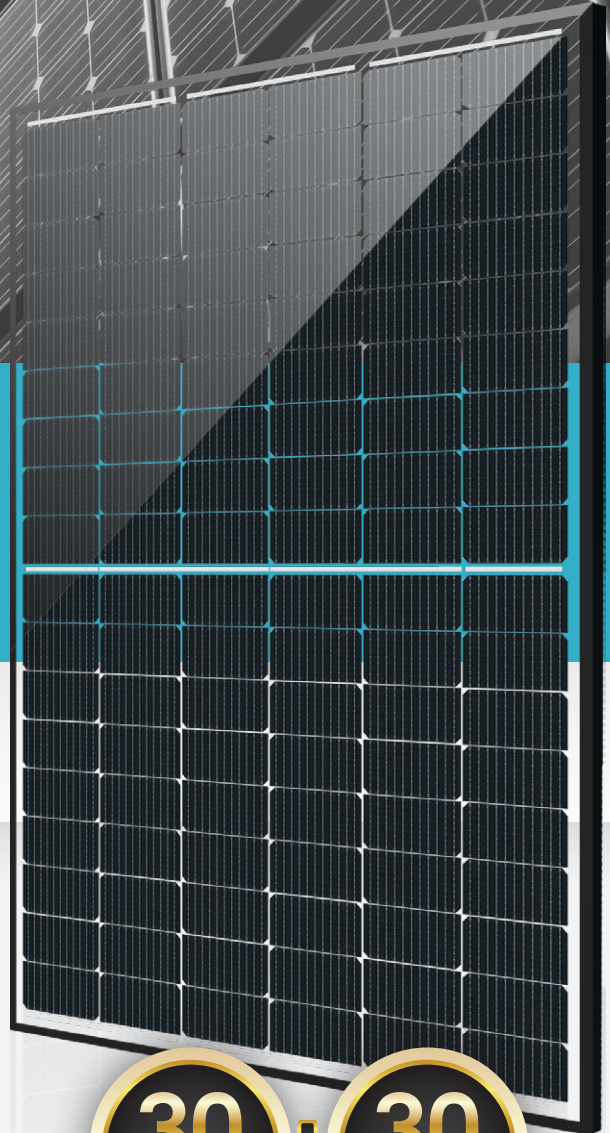
Improved durability with no extra weight



Quality controlled by artificial intelligence



Positive power tolerance of 0~+5W



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Electrical Specifications

STC rated output (P_{mpp})	450 Wp	455 Wp	460 Wp	465 Wp	470 Wp
Rated voltage (V_{mpp}) at STC	35.00 V	35.17 V	35.34 V	35.50 V	35.67 V
Rated current (I_{mpp}) at STC	12.86 A	12.94 A	13.02 A	13.10 A	13.18 A
Open circuit voltage (V_{oc}) at STC	41.65 V	41.85 V	42.05 V	42.25 V	42.45 V
Short circuit current (I_{sc}) at STC	13.56 A	13.66 A	13.76 A	13.86 A	13.96 A
Module efficiency	20.8%	21.0%	21.3%	21.5%	21.7%
Rated output (P_{mpp}) at NMOT	338.3 Wp	342.2 Wp	345.9 Wp	349.7 Wp	353.4 Wp
Rated voltage (V_{mpp}) at NMOT	32.94 V	33.10 V	33.26 V	33.42 V	33.58 V
Rated current (I_{mpp}) at NMOT	10.27 A	10.34 A	10.40 A	10.46 A	10.53 A
Open circuit voltage (V_{oc}) at NMOT	39.56 V	39.75 V	39.94 V	40.13 V	40.32 V
Short circuit current (I_{sc}) at NMOT	10.94 A	11.03 A	11.11 A	11.19 A	11.27 A
Temperature coefficient (P_{mpp})	- 0.29%/°C				
Temperature coefficient (I_{sc})	+ 0.043%/°C				
Temperature coefficient (V_{oc})	- 0.25%/°C				
Nominal module operating temperature (NMOT)	41±2°C				
Maximum system voltage (IEC/UL)	1500V _{DC}				
Number of diodes	2				
Junction box IP rating	IP 68				
Maximum series fuse rating	30 A				

STC: Irradiance 1000W/m², Cell Temperature 25°C, AM=1.5

NMOT: Irradiance 800W/m², Ambient Temperature 20°C, AM=1.5, Wind Speed 1m/s

Name plate tolerances: P_{max} +/-3.5%, V_{oc} +/-3.5%, I_{sc} +/-5%

Electrical Specifications (Integrated power)

Pmpp Gain	Pmpp / Wp	Vmpp / V	I _{mp} / A	Voc / V	Isc / A
5%	478	35.17	13.59	41.85	14.34
10%	501	35.17	14.25	41.85	15.02
15%	523	35.18	14.87	41.86	15.70
20%	546	35.18	15.52	41.86	16.39
25%	569	35.19	16.17	41.87	17.06

Other Specifications

Outer dimensions (L x W x H)	1903 x 1134 x 30 mm
Cell type	N type Mono-crystalline
No. of cells	120
Frame technology	Black Aluminum frame, Translucent backing
Front glass thickness	2+2 mm
Cable length (IEC/UL)	Portrait: (+) 350mm, (-) 250mm
Cable diameter (IEC/UL)	4 mm ² / 12 AWG
Maximum mechanical test load	5400 Pa (front) / 2400 Pa (back)
Connector type (IEC/UL)	PV-HCB40 (Astronergy) or PV-KST4-EV02/xy-UR, PVKBT4-EV02/xy (Stäubli)
Module weight	23 kg
Packing unit	36 pcs / box
Weight of packing unit (40ft container)	874 kg
Modules per 40ft container	864 pcs
Fire Class Rating	Class A
Country of Manufacturer	China

Curve

