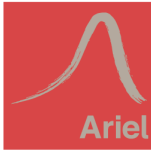


**Tier1**

BloombergNEF



Lloyd's Syndicate 1910



ISO14001

ISO9001

ISO45001



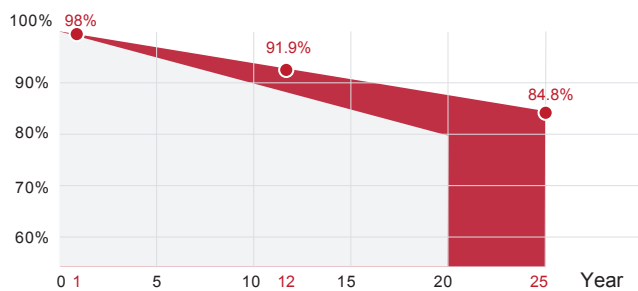
## M10 HIEFF TWIN MONO

### SPxxx-120M10

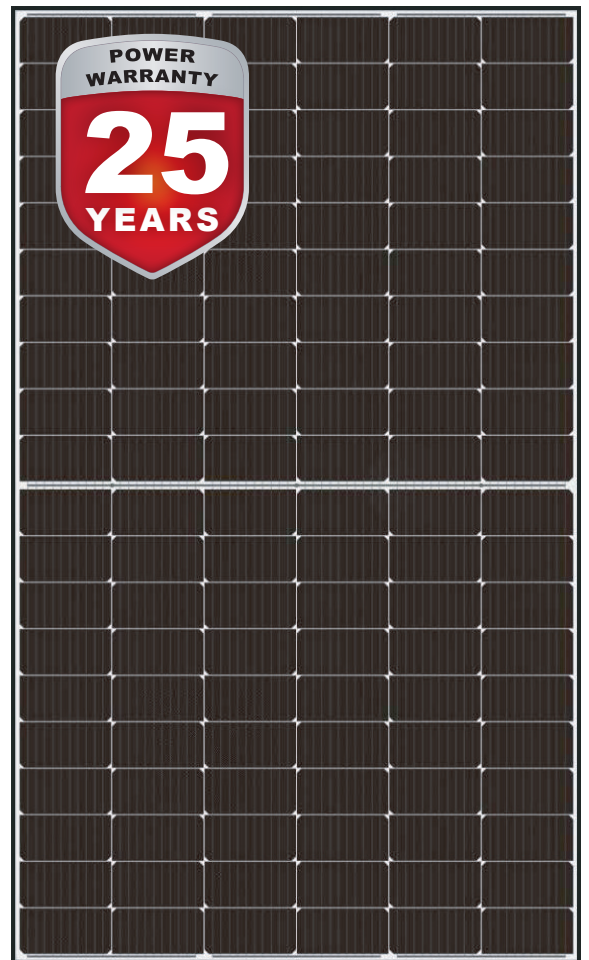
- Black frame (xxx=430~460W)
- Silver frame
- Full black
- Bifacial

12Yr quality guarantee | 25Yr power warranty

■ SUNPRO Standard (Additional value from 25-year warranty)  
 ■ Industry Standard



\*SUNPRO Standard tiered warranty



#### WARRANTY & GUARANTEE

Linear output power guarantee  
12 years: 91.9% power output  
25 years: 84.8% power output



#### WITHSTAND STRONG

Snow load 5400Pa  
Wind load 2400Pa



#### R&D AND PRODUCTION

Advanced production line.  
The leading solar cell cutting process and multi busbar design with SUNPRO Technology.



#### HIGH EFFICIENCY

Efficiency can reach 21.24%. Excellent low light performance. Higher power output under the conditions of haze, overcast, etc.



#### POWER TOLERANCE

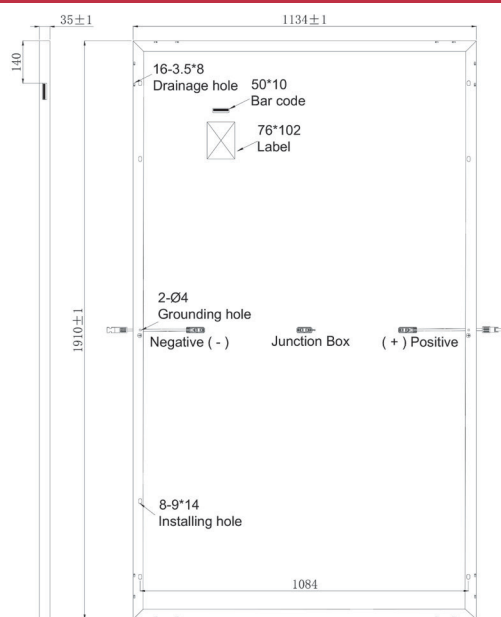
Power positive tolerance: 0~+3%

## Electrical parameters at standard test conditions (STC:AM=1.5, 1000W/m<sup>2</sup>, Cells Temperature 25°C)

### Typical type

	430W	435W	440W	445W	450W	455W	460W
Max power(Pmax)	430	435	440	445	450	455	460
Max power voltage(Vmp)	33.81	34.07	34.32	34.56	34.81	35.06	35.31
Max power current(Impp)	12.72	12.77	12.83	12.88	12.93	12.98	13.03
Open circuit voltage(Voc)	40.60	40.80	41.10	41.30	41.50	41.70	41.90
Short circuit current(Isc)	13.50	13.55	13.60	13.65	13.70	13.75	13.80
Module Efficiency(%)	19.85	20.08	20.31	20.55	20.78	21.01	21.24
Max system voltage	DC 1500V(TUV)						
Maximum Series Fuse Rating	25A						

### DIMENSIONS AND STRUCTURE



Side

Back

### Electrical parameters at NMOT test conditions

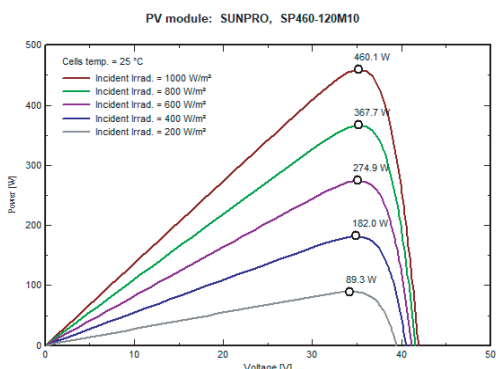
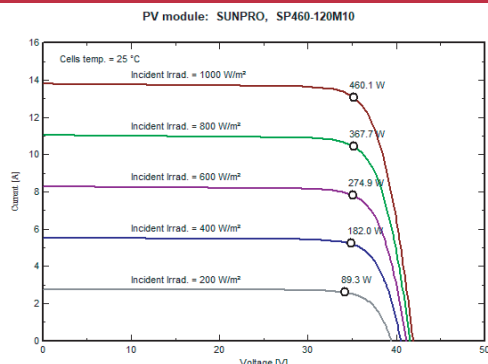
(Irradiance 800W/m<sup>2</sup>, Ambient Temperature 20°C, AM 1.5, Wind Speed 1m/s)

Typical type	430W	435W	440W	445W	450W	455W	460W
Max power(Pmax)	349.9	353.8	357.9	361.7	365.5	369.3	373.1
Max power voltage(Vmp)	34.30	34.50	34.80	35.00	35.20	35.50	35.70
Max power current(Impp)	10.20	10.24	10.29	10.33	10.37	10.41	10.45
Open circuit voltage(Voc)	41.00	41.00	41.30	41.50	41.70	41.90	42.10
Short circuit current(Isc)	10.78	10.82	10.86	10.90	10.94	10.98	11.02

### Mechanical Data

Dimensions	1910x1134x35mm
Weight	23.5 kg
Glass	3.2mm tempered glass
Output cables	4mm <sup>2</sup> , symmetrical lengths 1100mm
Connectors	MC4 compatible IP68
Cell type	Mono-Crystalline PERC, 10BB, 182x91mm
Number of cells	120cells ( Half-Cell )

### I-V CHARACTERISTICS AT DIFFERENT IRRADIATION



### Temperature Characteristics

Temp.Coeff.of Isc(TK Isc)	0.048%/°C
Temp.Coeff.of Voc(TK Voc)	-0.27%/°C
Temp.Coeff.of Pmax(TK Pmax)	-0.35%/°C
Operating temperature	-40~+85°C
Normal operating cell temperature	44±2°C

### Packing Configuration

Container	40'HQ
Pieces per pallet	62
Pallets per container	12
Pieces per container	744

### Tests, Certifications and Warranties

Standard tests	IEC 61215, IEC 61730, IEC 61701, IEC 62716, PPP 58042
System certs	ISO 9001, ISO14001, ISO45001
Certifications	TUV, CE, WEEE, INMETRO FIRE CERTIFICATE C1
Extreme wind and snow loads testing	Withstand extreme wind(2400 Pascal) and snow loads(5400 Pascal)
Power tolerance	0~+3%
Junction box	IP 68
Warranties	12 years product warranty and 25 years 84.8% of power