

Tier1

BloombergNEF

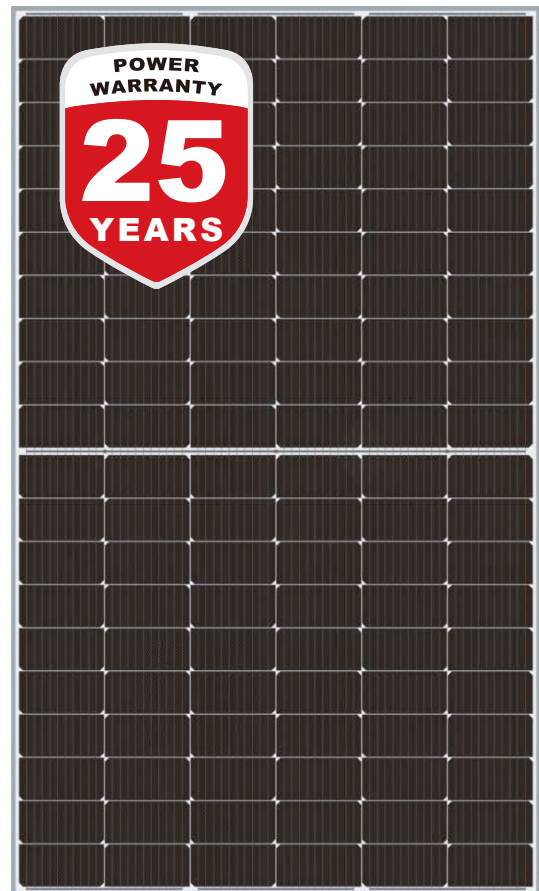
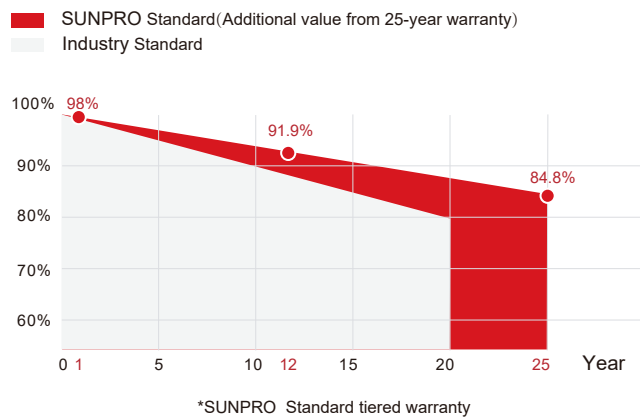


# M10 HI-EFF TWIN MONO

## SPxxx-120M10 445~470W

- Silver frame
- Black frame
- Full black

12Yr quality guarantee | 25Yr power 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 21.70%. Excellent low light performance. Higher power output under the conditions of haze, overcast, etc.



### POWER TOLERANCE

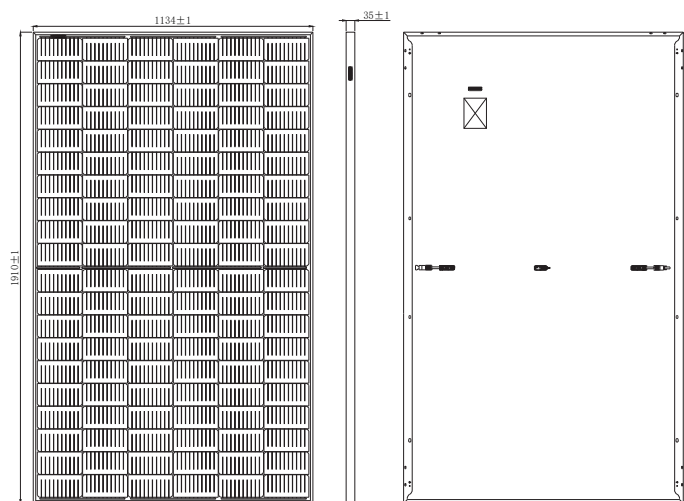
Power positive tolerance: 0~+5W

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

### Typical type

|                            | 445W                        | 450W  | 455W  | 460W  | 465W  | 470W  |
|----------------------------|-----------------------------|-------|-------|-------|-------|-------|
| Max power(Pmax)            | 445                         | 450   | 455   | 460   | 465   | 470   |
| Max power voltage(Vmp)     | 34.56                       | 34.81 | 35.06 | 35.31 | 35.56 | 35.81 |
| Max power current(Imp)     | 12.88                       | 12.93 | 12.98 | 13.03 | 13.08 | 13.13 |
| Open circuit voltage(Voc)  | 41.30                       | 41.50 | 41.70 | 41.90 | 42.10 | 42.30 |
| Short circuit current(Isc) | 13.65                       | 13.70 | 13.75 | 13.80 | 13.85 | 13.90 |
| Module Efficiency(%)       | 20.55                       | 20.78 | 21.01 | 21.24 | 21.47 | 21.70 |
| Max system voltage         | DC 1500V(TÜV) / 1000V (CUL) |       |       |       |       |       |
| Maximum Series Fuse Rating | 25A                         |       |       |       |       |       |

### DIMENSIONS AND STRUCTURE



### Electrical parameters at NMOT test conditions

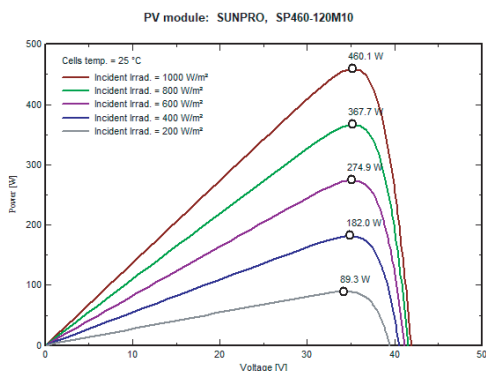
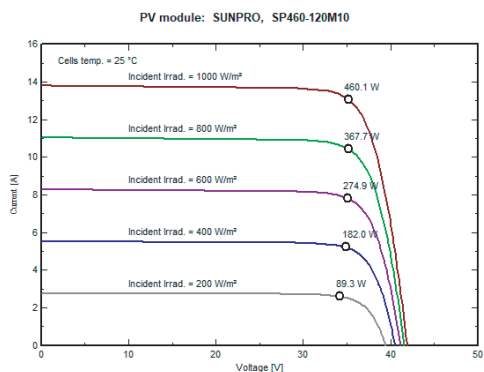
(Irradiance 800W/m<sup>2</sup>, Ambient Temperature 20°C, AM 1.5, Wind Speed 1m/s)

| Typical type               | 445W  | 450W  | 455W  | 460W  | 465W  | 470W  |
|----------------------------|-------|-------|-------|-------|-------|-------|
| Max power(Pmax)            | 331   | 335   | 339   | 342   | 346   | 350   |
| Max power voltage(Vmp)     | 31.80 | 32.10 | 32.30 | 32.50 | 32.70 | 32.90 |
| Max power current(Imp)     | 10.40 | 10.44 | 10.49 | 10.54 | 10.58 | 10.63 |
| Open circuit voltage(Voc)  | 38.50 | 38.70 | 38.90 | 39.10 | 39.30 | 39.40 |
| Short circuit current(Isc) | 11.00 | 11.04 | 11.08 | 11.12 | 11.16 | 11.20 |

### Mechanical Data

|                 |  |
|-----------------|--|
| Dimensions      | 1910x1134x35mm                                   |
| Weight          | 22.5 kg  |
| Glass           | 3.2mm ultra clear embossed tempered coated glass |
| Output cables   | 4mm <sup>2</sup> , symmetrical lengths 1100mm    |
| Connectors      | MC4 compatible IP68                              |
| Cell type       | Mono-Crystalline PERC, 182mm x 91mm              |
| 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)       | -0.34%/°C |
| Operating temperature             | -40~+85°C |
| Normal operating cell temperature | 44±2°C    |

### Packing Configuration

|                       |       |
|-----------------------|-------|
| Container             | 40'HQ |
| Pieces per pallet     | 31    |
| Pallets per container | 24    |
| 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                      | TÜV, CE, UL, INMETRO, WEEE                                      |
| Extreme wind and snow loads testing | Withstand extreme wind(2400 Pascal) and snow loads(5400 Pascal) |
| Power tolerance                     | 0~+5W   |
| Junction box                        | IP 68   |
| Warranties                          | 12 years product warranty and 25 years 84.8% of power           |