



## M6 HIEFF TWIN MONO by SUNPRO

SPxxx-144M  
(xxx=435~460)

HIGH EFFICIENCY



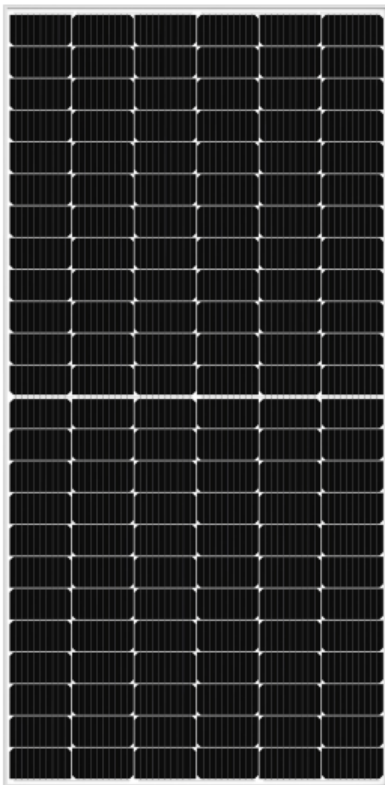
ISO 14001



ISO 9001



ISO 45001



### Reliability & Certification

Product Guarantee: **12-year**  
Linear Performance Warranty  
**12-year: 92.17%** power output  
**25-year: 85.28%** power output



#### POWER TOLERANCE

0~+3%



**WITHSTAND STRONG SNOW LOAD**  
**5400 Pa/ WIND LOAD 2400 Pa**



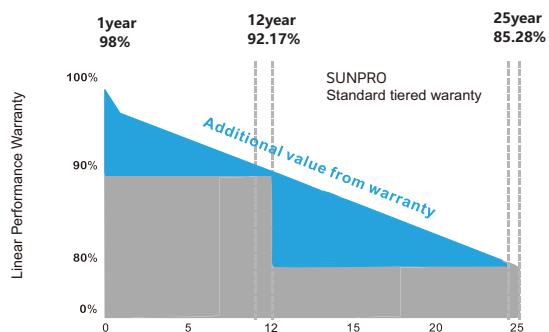
#### NEW TECHNOLOGY: HIEFF UP TO 21,17%

Higher yield per surface area,  
lower BOS costs, higher power classes,  
and an efficiency rate of up to 21.17%.



#### PRODUCT WITH HIEFF BY SUNPRO TECHNOLOGY

SUNPRO combines cutting edge cell  
separation and innovative 9-busbar design  
with SUNPRO Technology.



## Product Specification

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

Typical type	435W	440W	450W	455W	460W
Max power(Pmax)	435	440	450	455	460
Open circuit voltage (Voc)	49.5	49.6	49.8	49.9	50.0
Short circuit current (Isc)	11.23	11.34	11.56	11.65	11.69
Max power voltage(Vmp)	40.7	40.8	41.0	41.1	41.2
Max power current(Imp)	10.69	10.79	10.98	11.08	11.17
Module Efficiency(%)	20.01	20.24	20.70	20.93	21.16
Max system voltage	DC 1500V(TUV) / DC 1000V(TUV)				
Maximum Series Fuse Rating	25A				

## Electrical parameters at NMOT test conditions

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

Item	435W	440W	450W	455W	460W
Max power(Pmax)	353.9	358	366	370.2	374.3
Open circuit voltage (Voc)	49.7	49.8	50.0	50.1	50.2
Short circuit current (Isc)	8.96	9.05	9.23	9.30	9.33
Max power voltage(Vmp)	41.7	41.8	42.0	42.1	42.3
Max power current(Imp)	8.49	8.56	8.72	10.69	10.69

## Mechanical Data

Item	Specification
Dimensions	2094x1038x35mm
Weight	24.2kgs
Front glass	3.2mm tempered glass
	4mm <sup>2</sup>
Output cables	symmetrical lengths 1300mm

Connectors MC4 compatible IP68

Cell type Mono-Crystalline PERC Half-Cell  
9BB 83x166mm

Number of cells 144 cells

## Temperature Characteristics

Item	Specification
Temp.Coeff.of Isc(TK Isc)	0.05%/°C
Temp.Coeff.of Voc(TK Voc)	-0.29%/°C
Temp.Coeff.of Pmax(TK Pmax)	-0.34%/°C
Operating temperature	-40~+85°C
Normal operating cell temperature	44±2°C

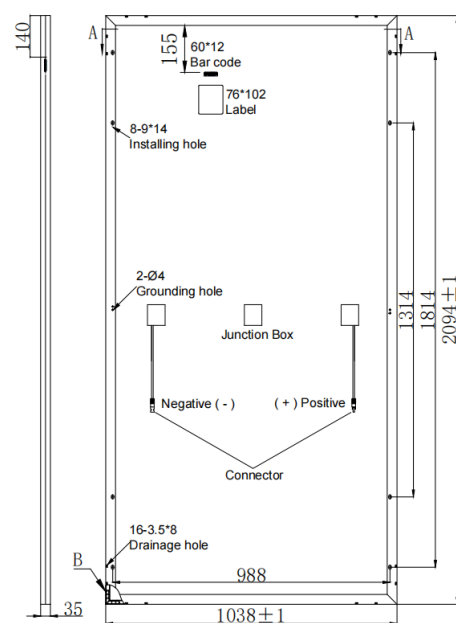
## Packing Configuration

Item	Specification
Container	40'HQ
Pieces per pallet	66
Pallets per container	11
Pieces per container	726

## Test, Certifications and Warranties

Item	Specification
Standard tests	IEC 61215, IEC 61730, IEC 61701, IEC 62716, PPP 58042B
System certs	ISO 9001, ISO14001, ISO45001
Certifications	TUV, AMMONIA AND SALT MIST CORROSION, ANTI-PID, CE, WEEE, INMERTRO
Extreme wind and snow loads testing	Withstand extreme wind(2400 Pascal) and snow loads(5400 Pascal)
Power tolerance	0~+3%
Junction box	IP68
Warranties	12 years product warranty and 25 years 85.28% of power

## Dimensions and Structure



## I-V Curve

I-V characteristics at different irradiation

