



M10 HIEFF TWIN MONO by SUNPRO

SPxxx-120M10
(xxx=440~460)

HIGH EFFICIENCY



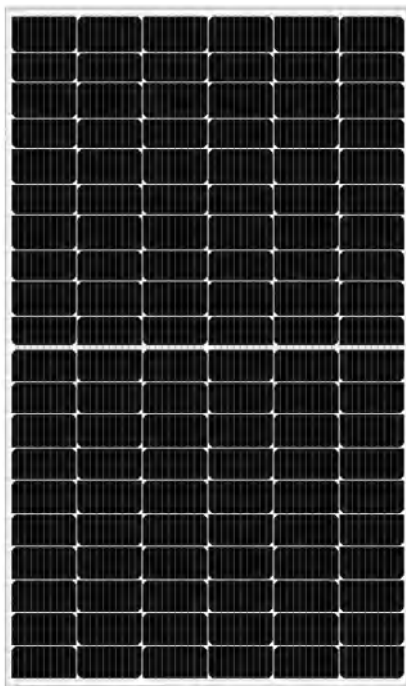
ISO 14001



ISO 9001



ISO 45001



POWER TOLERANCE

0~+3%



WITHSTAND STRONG SNOW LOAD 5400 Pa/ WIND LOAD 2400 Pa



NEW TECHNOLOGY: HIEFF UP TO 21,24%

Higher yield per surface area,
lower BOS costs, higher power classes,
and an efficiency rate of up to 21.24%.

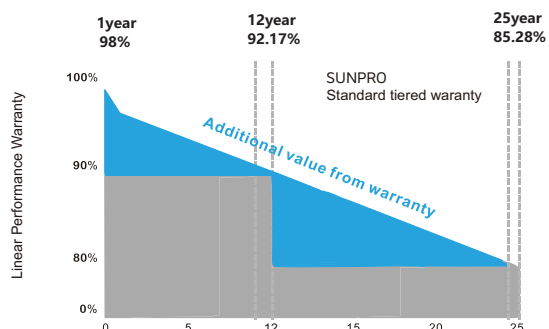


PRODUCT WITH HIEFF BY SUNPRO TECHNOLOGY

SUNPRO combines cutting edge cell
separation and innovative 10-busbar
design with SUNPRO Technology.

Reliability & Certification

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



Product Specification

Electrical parameters at standard test conditions
(STC:AM=1.5, 1000W/m² ,Cells Temperature25°C)

Typical type	440W	445W	450W	455W	460W
Max power(Pmax)	440	445	450	455	460
Max power voltage(Vmp)	34.32	34.56	34.81	35.06	35.31
Max power current(Imp)	12.83	12.88	12.93	12.98	13.03
Open circuit voltage (Voc)	41.10	41.30	41.50	41.70	41.90
Short circuit current (Isc)	13.60	13.65	13.70	13.75	13.80
Module Efficiency(%)	20.31	20.55	20.78	21.01	21.24
Max system voltage	DC 1500V(TUV) / DC 1000V(TUV)				
Maximum Series Fuse Rating	25A				

Electrical parameters at NMOT test conditions

(NMOT:Irradiance 800W/m²,Ambient Temperature 20℃,AM 1.5,Wind Speed 1m/s)

Item	440W	445W	450W	455W	460W
Max power(Pmax)	357.9	361.7	365.5	369.5	373.1
Max power voltage(Vmp)	34.8	35.0	35.0	35.5	35.7
Max power current(Imp)	10.29	10.33	10.37	10.41	10.45
Open circuit voltage (Voc)	41.3	41.5	41.7	41.9	42.1
Short circuit current (Isc)	10.86	10.90	10.94	10.98	11.02

Mechanical Data

Item	Specification
Dimensions	1910x1134x35mm
Weight	29kgs
Front glass	3.2mm tempered glass
Output cables	4mm²
	symmetrical lengths
	1100mm

Connectors	MC4 compatible IP68
Cell type	Mono-Crystalline PERC Half-Cell
Number of cells	120 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

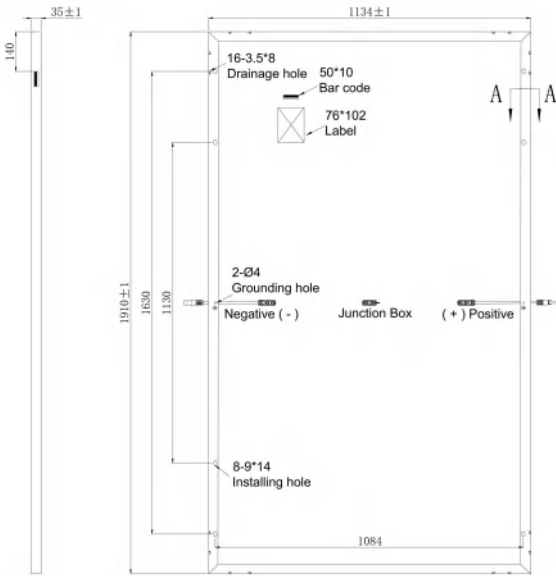
Packing Configuration

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

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

