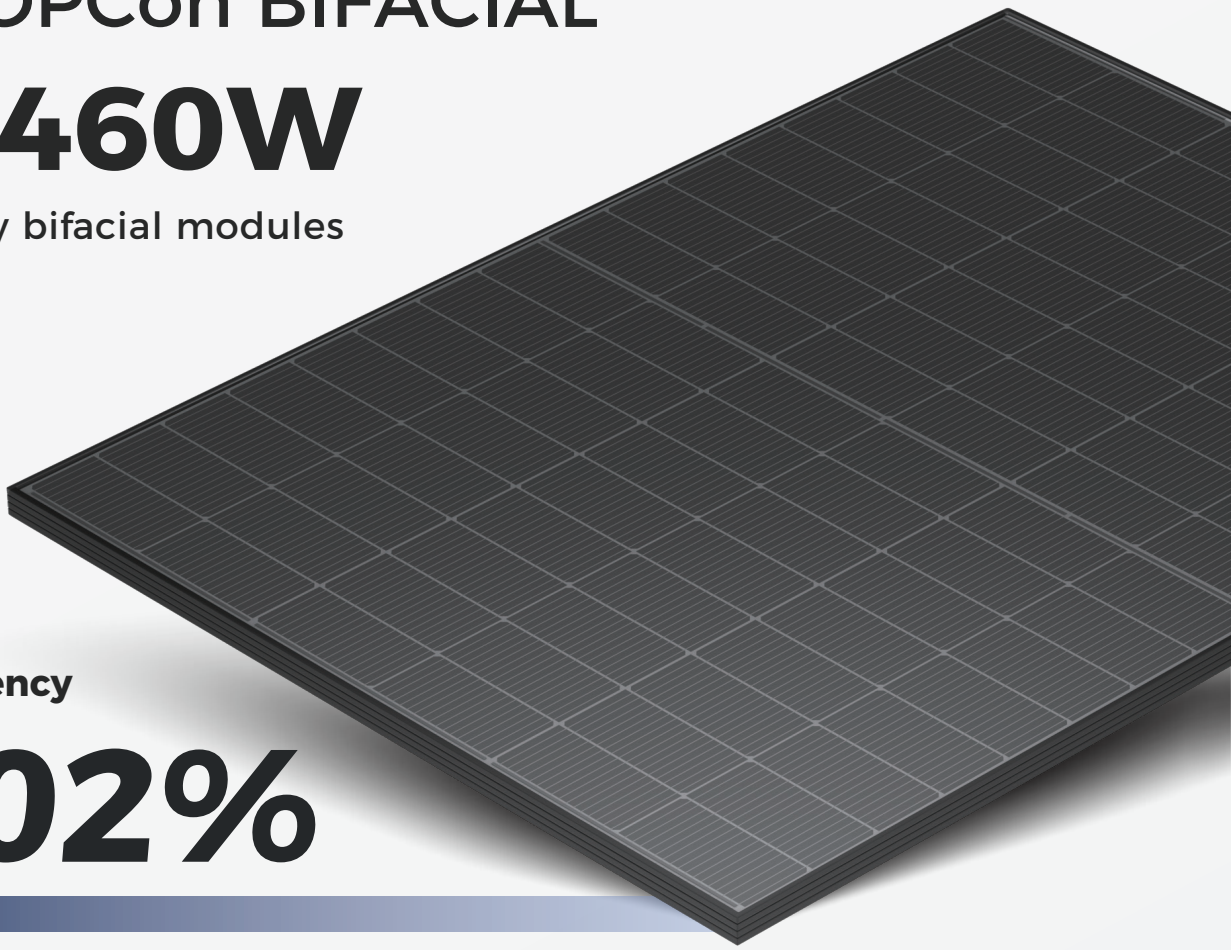
KLEINES KRAFTWERK

Tier1 BloombergNEF

210R TOPCon BIFACIAL

445-460W

High efficiency bifacial modules



Module efficiency

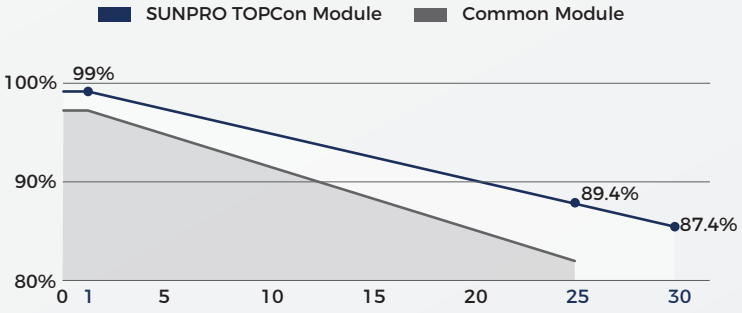
23.02%

WITHSTAND STRONG

PID RESISTANCE

AUTOMATIC PRODUCTION

HIGH EFFICIENCY



WARRANTY

Quality Guarantee 25 years

Power Warranty 30 years

CERTIFICATE

ELECTRIC CHARACTERISTICS

SPDG (445/460W)-N96R12

Model of modules	SPDG445-N96R12		SPDG450-N96R12		SPDG455-N96R12		SPDG460-N96R12	
	STC	NMOT	STC	NMOT	STC	NMOT	STC	NMOT
Power (Pmax/W)	445	336.50	450	340.70	455	344.80	460	348.90
Maximu power current (Vmp)	29.69	27.90	29.93	28.10	30.16	28.40	30.39	28.60
Maximu power current (Imp)	14.99	12.06	15.04	12.11	15.09	12.14	15.14	12.18
Open circuit voltage (Voc)	35.54	33.70	35.8	33.90	36.06	34.20	36.3	34.50
Short circuitcurrent (Isc)	15.86	12.77	15.9	12.80	15.94	12.84	15.99	12.88
Module efficiency	22.27%		22.52%		22.77%		23.02%	

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

NMOT (Irradiance 800W/m², Ambient Temperature 20℃,AM1.5,Wind Speed 1m/s)

ELECTRICAL CHARACTERISTICS WITH 15% REAR SIDE POWER GAIN

Front power Pmax/W	511.75	517.50	523.25	529.00
Maximu power voltage (Vmp)	29.69	29.93	30.16	30.39
Maximu power current (Imp)	17.24	17.29	17.35	17.41
Open circuit voltage (Voc)	35.54	35.80	36.06	36.3
Short circuitcurrent (Isc)	18.24	18.29	18.33	18.39

STRUCTURAL CHARACTERISTICS

Module size (L*W*H)	1762x1134x30mm
Weight	23.8kg
Cell	96 cells,N type Mono-Crystalline , 182.2mm×105 mm
Front glass	2.0mm , Anti-Reflection Coating
Back glass	2.0mm , Heat Strengthened Glass
Frame	Anodized aluminum alloy
Junction box	IP68 , 3 bypass diodes
Output wire	4mm²
Wire length	Line length 1100mm/customized
Connector	MC4 Compatible
Packing Specification	37 pcs/Pallet ; 962 pcs/40' HQ

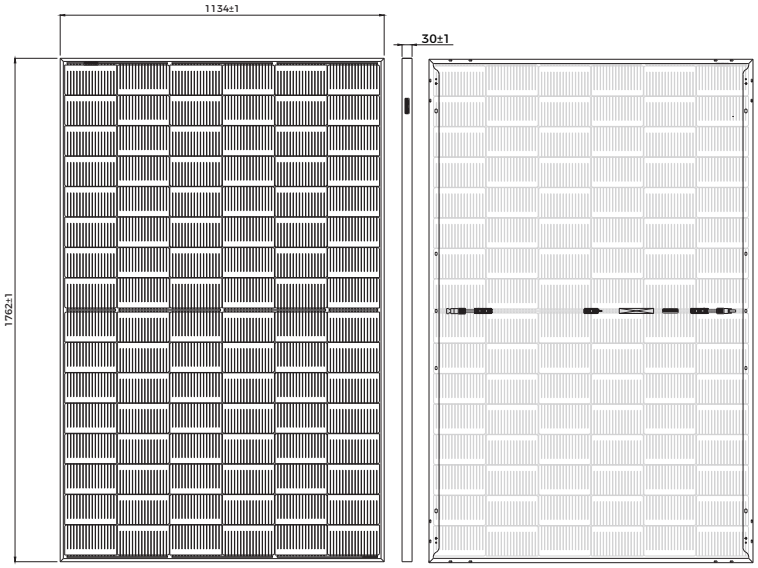
OPERATING PARAMETERS

Power tolerance (W)	(0~+5W)
Maximum system voltage (V)	1500V
Maximum rated fuse current (A)	30A
Current operating temperature (C)	-40~+85℃
Mechanical load	+5400Pa/-2400Pa

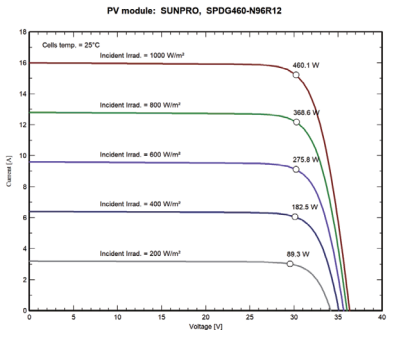
TEMPERATURE CHARACTERISTICS

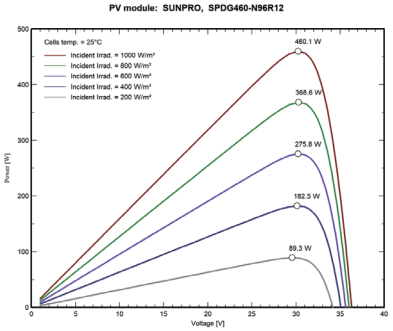
Temp. Coeff. of Isc (TK Isc)	0.045% / ℃
Temp. Coeff. of Voc (TK Voc)	-0.25% / ℃
Temp. Coeff. of Pmax (TK Pmax)	-0.30% / ℃
Normal Operting Cell Temperature	45±2℃

MODULE DIMENSIONS(MM)



I-V CHARACTERISTICS AT DIFFERENT IRRADIATION





Zhejiang Sunpro Power Technology Co., Ltd

Add.: Qinggang Iustrial Zone, Yuhuan City, Zhejinag Province

Tel: +86 0576-80730906 E-mail: info@sunpropower.com Website: www.sunpropower.com

*The above parameters are for reference only, and the actual parameters of the factory shall prevail