



High Power Output  
Low LCOE

Maximum Power  
470W+

# TWMNH

N-type Half-cell Dual Glass  
Monofacial Full-black Module(48)

## 48HE440-470W

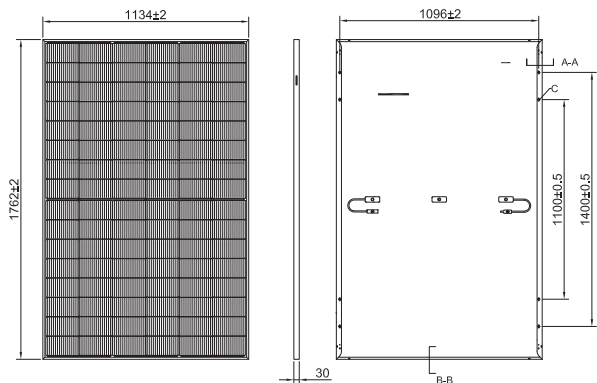


Tongwei Co.,Ltd.  
<https://en.tongwei.cn/>



Learn More

**Drawing (Unit: mm)**



**Mechanical Parameters**

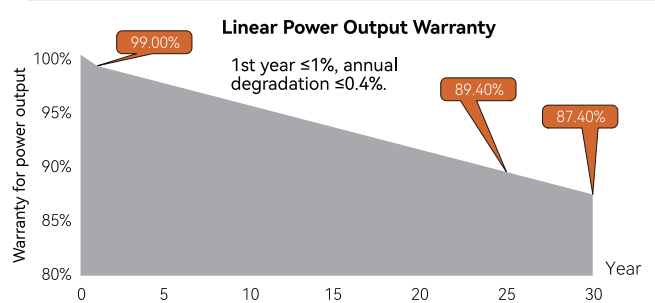
Cell Type	TNC (N Type Monocrystalline Cell)
Cell Orientation	96[6×16]
Dimensions	1762±2×1134±2×30mm
Weight	23.7kg
Front Glass	2.0mm AR coating semi tempered glass
Rear Glass	2.0mm semi tempered glass
Frame	Anodized aluminum alloy black frame
Junction Box	IP68, 3diodes
Cable	4.0mm <sup>2</sup>
Cable length	+1200mm, -1200mm, length can be customized
Connector	TW-PVCON-01(Tongwei Solar) PV-KST4-EVO2/xy_UR, PV-KBT4-EVO2/xy_UR(Staubli) PV-KST4-EVO2A/xy, PV-KBT4-EVO2A/xy(Staubli) PV-ZH202B(Zhonghuan )
Wind/Snow load	2400Pa/5400Pa
Per pallet	36pcs
Packaging	936pcs per 40'HC

**Electrical Characteristics (STC)**

Moduel type:	TWMNH-48 HE440	TWMNH-48 HE445	TWMNH-48 HE450	TWMNH-48 HE455	TWMNH-48 HE460
Maximum Power: Pmax [W]	440	445	450	455	460
Open Circuit Voltage: Voc [V]	35.65	35.80	35.95	36.10	36.25
Short Circuit Current: Isc [A]	15.74	15.79	15.84	15.89	15.94
Voltage at Maximum Power: Vmp [V]	29.55	29.85	30.15	30.44	30.73
Current at Maximum Power: Imp [A]	14.89	14.91	14.93	14.95	14.97
Module Efficiency: η [%]	22.0	22.3	22.5	22.8	23.0

\* STC: Irradiance 1000W/m<sup>2</sup>, Cell Temperature 25°C, AM=1.5, Power measurement tolerance: ±3%

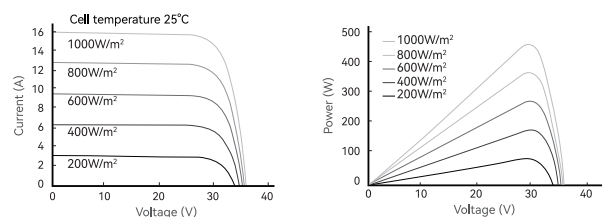
**Linear Warranty**



**Temperature Rating**

Temperature Coefficient of Pmax	-0.28%/°C
Temperature Coefficient of Voc	-0.24%/°C
Temperature Coefficient of Isc	+0.046%/°C

**I-V Curve**



**Operating Parameters**

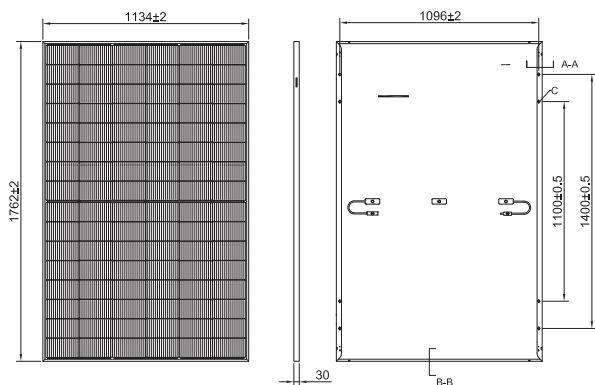
Operating Temperature	-40°C~+70°C
Maximum System Voltage	1500V DC
Maximum Series Fuse Rating	30A
Power Selection Tolerance	0~+3%
Fire Class Rating	Class C

**Certifications**

**Quality Management System and Product Certification**  
 ISO 9001: 2015 / Quality management systems  
 ISO 14001: 2015 / Environmental management systems  
 ISO 45001: 2018 / Occupational health and safety management systems  
 ISO 50001: 2018 / Energy management systems  
 IEC 62941: 2019 / Quality system for PV module manufacturing  
 IEC 61215(2021) / IEC 61730(2023)



**Drawing (Unit: mm)**



**Mechanical Parameters**

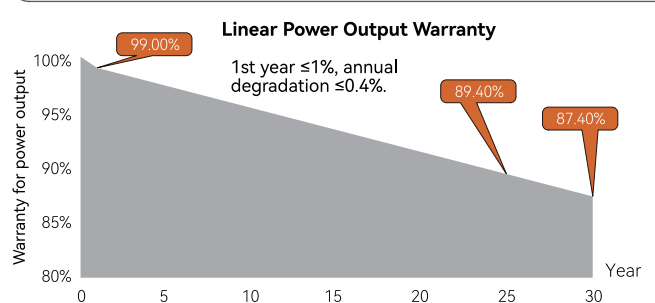
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**Electrical Characteristics (STC)**

Moduel type:	TWMNH-48 HE465	TWMNH-48 HE470
Maximum Power: Pmax [W]	465	470
Open Circuit Voltage: Voc [V]	36.40	36.55
Short Circuit Current: Isc [A]	15.99	16.00
Voltage at Maximum Power: Vmp [V]	31.03	31.34
Current at Maximum Power: Imp [A]	14.99	15.00
Module Efficiency: η [%]	23.3	23.5

\* STC: Irradiance 1000W/m<sup>2</sup>, Cell Temperature 25°C, AM=1.5, Power measurement tolerance: ±3%

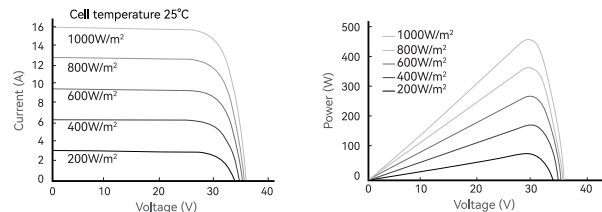
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