

Jäger Plus

HIGH PERFORMANCE
MONOCRYSTALLINE PERC MODULE



G2.3

RSM144-6-395M-420M

144 CELL

Mono PERC Module

395-420Wp

Power Output Range

1500VDC

Maximum System Voltage

20.9%

Maximum Efficiency

KEY SALIENT FEATURES



Global, Tier 1 bankable brand, with independently certified state-of-the-art automated manufacturing



Industry leading lowest thermal co-efficient of power



Industry leading 12 years product warranty



Excellent low irradiance performance



Excellent PID resistance



Positive tight power tolerance



Dual stage 100% EL Inspection warranting defect-free product



Module Imp binning radically reduces string mismatch losses



Warranted reliability and stringent quality assurances well beyond certified requirements



Certified to withstand severe environmental conditions

- Anti-reflective & anti-soiling surface minimise power loss from dirt and dust
- Severe salt mist, ammonia & blown sand resistance, for seaside, farm and desert environments
- Excellent mechanical load 2400Pa & snow load 5400Pa resistance



RISEN ENERGY CO., LTD.

Risen Energy is a leading, global tier 1 manufacturer of high-performance solar photovoltaic products and provider of total business solutions for residential, commercial and utility-scale power generation. The company, founded in 1986, and publicly listed in 2010, compels value generation for its chosen global customers. Techno-commercial innovation, underpinned by consummate quality and support, encircle Risen Energy's total Solar PV business solutions which are among the most powerful and cost-effective in the industry. With local market presence and strong financial bankability status, we are committed, and able, to building strategic, mutually beneficial collaborations with our partners, as together we capitalise on the rising value of green energy.

Tashan Industry Zone, Meilin, Ninghai 315609, Ningbo | PRC

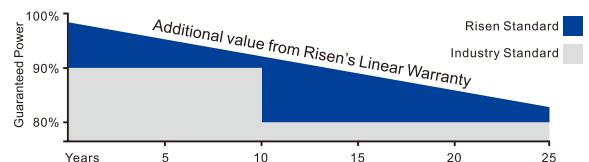
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E-mail: marketing@risenenergy.com Website: www.risenenergy.com



LINEAR PERFORMANCE WARRANTY

12 year Product Warranty / 25 year Linear Power Warranty

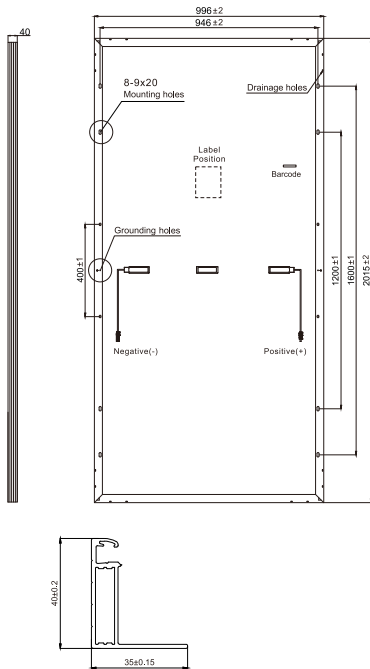


★ Please check the valid version of Limited Product Warranty which is officially released by Risen Energy Co., Ltd

THE POWER OF RISING VALUE

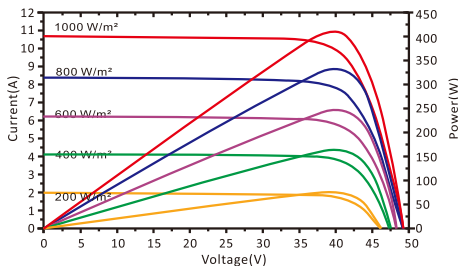
Dimensions of PV Module

Unit: mm



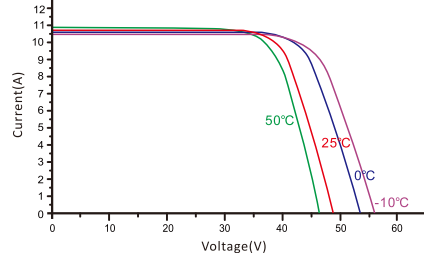
RSM144-6-410M

I-V characteristics at different irradiances



I-V characteristics at different temperatures

(AM1.5, 1000W/m²)



Our Partners:

ELECTRICAL DATA (STC)

Model Number	RSM144-6-395M	RSM144-6-400M	RSM144-6-405M	RSM144-6-410M	RSM144-6-415M	RSM144-6-420M
Rated Power in Watts-Pmax(Wp)	395	400	405	410	415	420
Open Circuit Voltage-Voc(V)	48.45	48.60	48.75	48.90	49.00	49.10
Short Circuit Current-Isc(A)	10.40	10.50	10.60	10.70	10.80	10.90
Maximum Power Voltage-Vmpp(V)	40.35	40.45	40.55	40.65	40.70	40.80
Maximum Power Current-Imp(A)	9.80	9.90	10.00	10.10	10.20	10.30
Module Efficiency (%) *	19.7	19.9	20.2	20.4	20.7	20.9

STC: Irradiance 1000 W/m², Cell Temperature 25°C, Air Mass AM1.5 according to EN 60904-3.

* Module Efficiency (%): Round-off to the nearest number

ELECTRICAL DATA (NMOT)

Model Number	RSM144-6-395M	RSM144-6-400M	RSM144-6-405M	RSM144-6-410M	RSM144-6-415M	RSM144-6-420M
Maximum Power-Pmax (Wp)	295.6	299.3	303.1	306.9	309.2	312.7
Open Circuit Voltage-Voc (V)	44.60	44.70	44.90	44.99	45.63	45.70
Short Circuit Current-Isc (A)	8.53	8.61	8.69	8.77	8.80	8.87
Maximum Power Voltage-Vmpp (V)	37.00	37.05	37.14	37.24	37.30	37.40
Maximum Power Current-Imp (A)	8.00	8.08	8.16	8.24	8.29	8.36

NMOT: Irradiance at 800 W/m², Ambient Temperature 20°C, Wind Speed 1 m/s.

MECHANICAL DATA

Solar cells	Monocrystalline, 9BB
Cell configuration	144 cells (6×12+6×12)
Module dimensions	2015×996×40mm
Weight	23kg
Superstrate	High Transmission, Low Iron, Tempered ARC Glass
Substrate	White Back-sheet
Frame	Anodized Aluminium Alloy type 6063T5, Silver Color
J-Box	Potted, IP68, 1500VDC, 3 Schottky bypass diodes
Cables	4.0mm² (12AWG), Positive(+)270mm, Negative(-)270mm
Connector	Risen Twinsel PV-SY02, IP68

TEMPERATURE & MAXIMUM RATINGS

Nominal Module Operating Temperature (NMOT)	44°C±2°C
Temperature Coefficient of Voc	-0.29%/°C
Temperature Coefficient of Isc	0.05%/°C
Temperature Coefficient of Pmax	-0.37%/°C
Operational Temperature	-40°C~+85°C
Maximum System Voltage	1500VDC
Max Series Fuse Rating	20A
Limiting Reverse Current	20A

PACKAGING CONFIGURATION

	40ft(HQ)	20ft
Number of modules per container	594	270
Number of modules per pallet	27	27
Number of pallets per container	22	10
Packaging box dimensions (LxWxH) in mm	2040×1130×1130	2040×1130×1130
Box gross weight[kg]	670	670

CAUTION: READ SAFETY AND INSTALLATION INSTRUCTIONS BEFORE USING THE PRODUCT.

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THE POWER OF RISING VALUE

Cheetah HC 72M 390-410 Watt

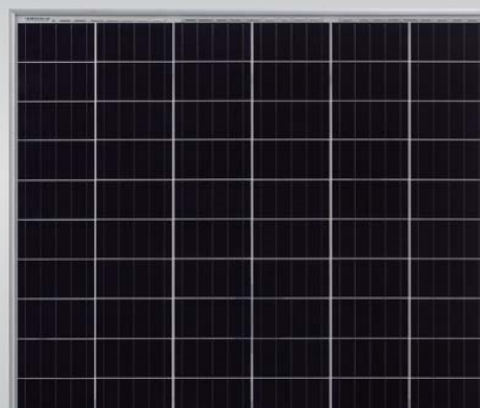
MONO PERC HALF CELL MODULE

Positive power tolerance of 0~+3%

- Half Cell
- Mono PERC 72 Cell



PERC



KEY FEATURES



5 Busbar Solar Cell

5 busbar solar cell adopts new technology to improve the efficiency of modules, offers a better aesthetic appearance, making it perfect for rooftop installation.



High Efficiency

Higher module conversion efficiency (up to 20.38%) benefit from half cell structure (low resistance characteristic).



PID Resistance

Excellent Anti-PID performance guarantee limited power degradation for mass production.



Low-light Performance

Advanced glass and cell surface textured design ensure excellent performance in low-light environment.



Severe Weather Resilience

Certified to withstand: wind load (2400 Pascal) and snow load (5400 Pascal).



Durability Against Extreme Environmental Conditions

High salt mist and ammonia resistance certified by TUV NORD.

LINEAR PERFORMANCE WARRANTY

12 Year Product Warranty • 25 Year Linear Power Warranty

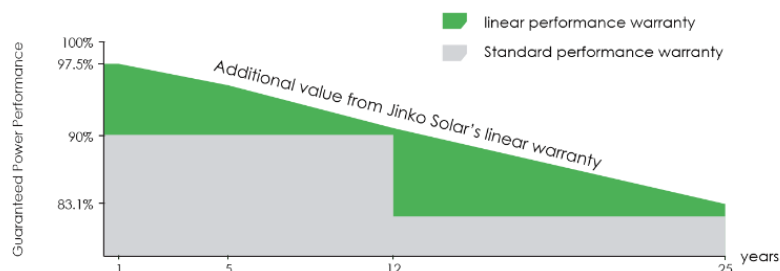


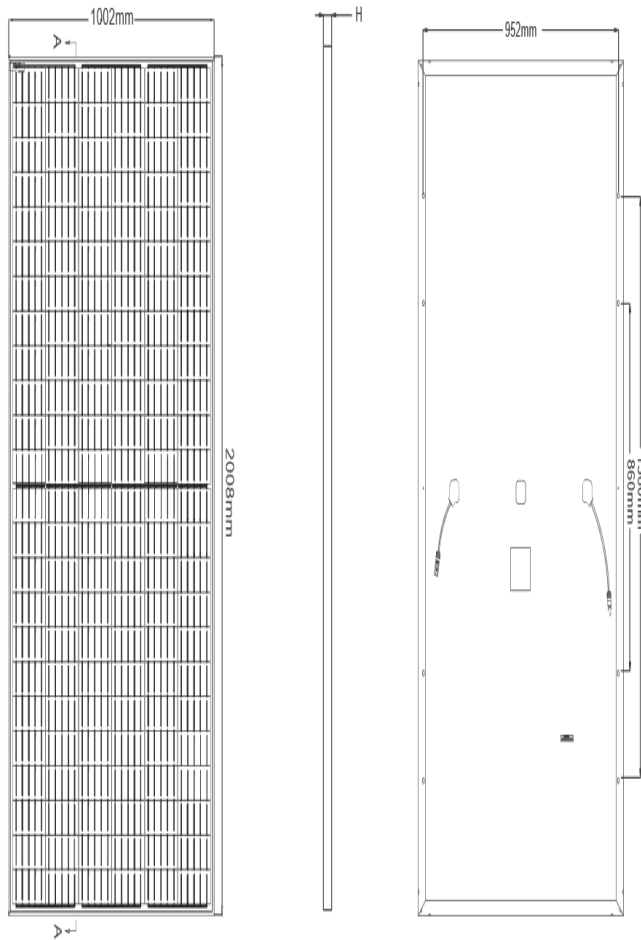
- ISO9001:2015, ISO14001:2015, OHSAS18001 certified factory
- IEC61215, IEC61730, UL1703 certified product

Nomenclature:

JKMxxxM-60/72H-V

Code	Cell	Code	Certification
null	Full	null	1000V
H	Half	V	1500V



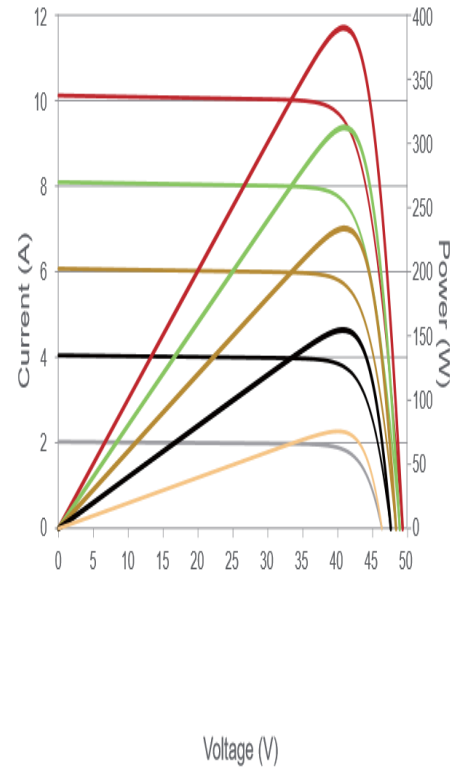


Front

Side

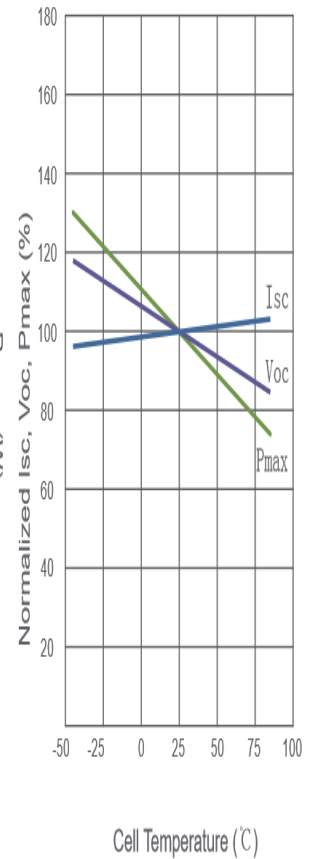
Back

Current-Voltage & Power-Voltage Curves (390W)

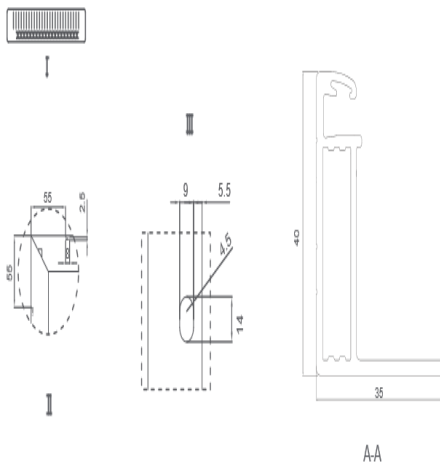


Voltage (V)

Temperature Dependence of Isc, Voc, Pmax



Cell Temperature (°C)



Length: $\pm 2\text{mm}$
Width: $\pm 2\text{mm}$
Height: $\pm 1\text{mm}$
Row Pitch: $\pm 2\text{mm}$

AA

Packaging Configuration

(Two pallets = One stack)

27pcs/pallet, 54pcs/stack, 594pcs/40'HQ Container

Mechanical Characteristics

Cell Type	Mono PERC 158.75×158.75mm
No. of Half-cells	144 (6×24)
Dimensions	2008×1002×40mm (79.06×39.45×1.57 inch)
Weight	22.5 kg (49.6 lbs)
Front Glass	3.2mm, Anti-Reflection Coating, High Transmission, Low Iron, Tempered Glass
Frame	Anodized Aluminium Alloy
Junction Box	IP67 Rated
Output Cables	TÜV 1x4.0mm ² , (+) 290mm, (-) 145mm or Customized Length

Mono-Crystalline Solar PV Module 72 Cells Series (156.75X156.75MM)



Performance

- Water resistant junction box IP67, IP68 with bypass diode and high strength polymer sheet on module's rear ensures module is sealed from moisture and mechanical damage
- AR coating low iron pattern tempered glass
- UV protection
- Unique drainage hole design and clear anodized aluminum frame
- PV cable with Connector type MC4

Quality and Reliability

- Superior reliability with guaranteed 0~5 w power output tolerance
- 15 years warranty on materials and workmanship,
- 25 years linear power warranty, 97% in the first year, 91% in 10th year, and ending with 80% in 25th year
- Cells are individually tested, characterized and modulated prior to interconnection
- Test and produce standard: IEC61215, IEC61730, ISO 9001:2015, ISO14001:2015, ISO45001:2018, TIS18001:2011, TIS61215-1-1:2561, TIS2580:2562

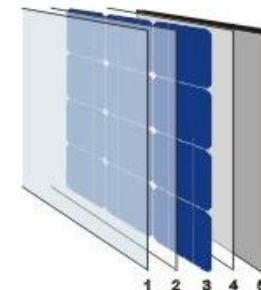
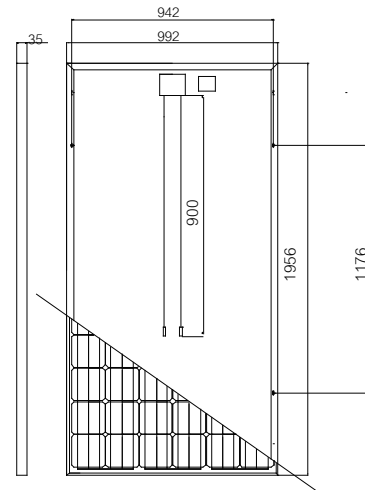
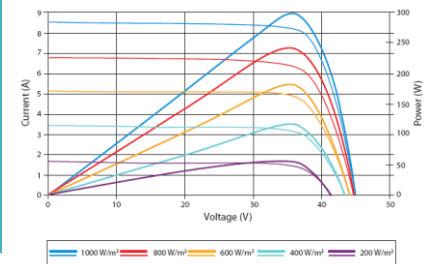
Electrical Characteristics

Specification	F - 330M	F - 340M	F - 350M	F - 360M	F-370M	F-380M
Rating power at STC (Wp)	330W	340W	350W	360W	370W	380W
Open circuit voltage (Voc)	46.7V	47.1V	47.5V	48.0V	48.4V	48.8V
Short circuit current (Isc)	9.30A	9.40A	9.50A	9.60A	9.70A	9.8A
Rated voltage (Vm)	38.4V	38.7V	39.1V	39.5V	39.9V	40.03V
Rated current (Im)	8.60A	8.79A	8.94A	9.12A	9.28A	9.49A
Module efficiency (%)	17.01%	17.52%	18.04%	18.55%	19.07%	19.58%
Power tolerance	0 - 3 % (W)					
Temperature coefficient of Pm	-0.40%/K					
Temperature coefficient of Isc	+0.052%/K					
Temperature coefficient of Voc	-0.31%/K					
Maximum system voltage	DC1000v (UL) / DC1500V (IEC)					
All technical data at STC: AM1.5; 1000W/m ² ; 25°C						

Mechanical Characteristics

Solar Cell	156.75 x 156.75 mm (6 inches)
No. of cells	72 (6X12)
Nominal Operating Cell Temperature (NOCT)	46 ± 2 °C
Maximum system voltage	DC600v (UL) / DC1000V (IEC)
Operation temperature	From -40 to + 85°C
Typical Application	24V DC
Max series fuse rating	15A
Max wind resistance	2400Pa
Surface max. load capacity	5400Pa
Weight	21.4kg
Dimension	1956X992X35MM

Current-Voltage & Power-Voltage Curve (300-24)



1. Tempered glass
2. EVA
3. Cells
4. EVA
5. Back sheet

AstroSemi™

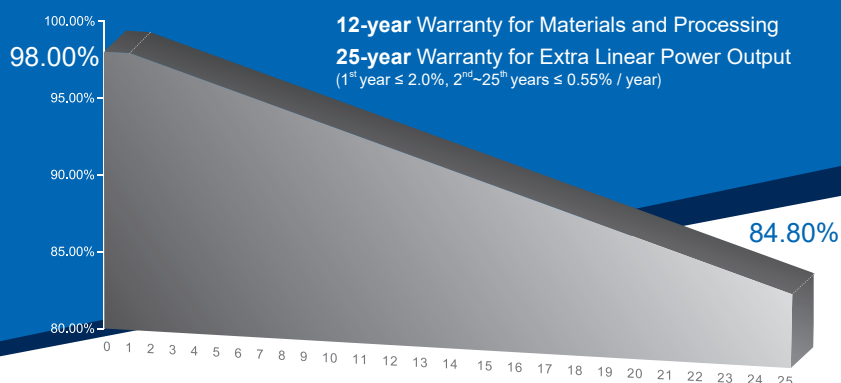
Incredible Power for Small Body



405W~420W

Monocrystalline PV Module

CHSM72M-HC Series (158.75)



KEY FEATURES

- +5W OUTPUT POSITIVE TOLERANCE**
Guaranteed 0~+5W positive tolerance ensures power output reliability.
- INNOVATIONAL HALF-CELL TECHNOLOGY**
Improves the module output, decreases the risk of micro-crack, enhances the module reliability.
- INNOVATIVE PERC CELL TECHNOLOGY**
Excellent cell efficiency and output.
- REDUCE SHADOW LOSS**
Effectively reduces the effect of shadow on the module surface.
- REDUCE INTERNAL MISMATCH LOSS**
Reduces mismatch loss and improves output.
- PASSED HAIL TEST**
Certified to hail resistance: ice ball size (d=25mm) and ice ball velocity (v=23m/s).
- Anti PID PID RESISTANCE**
Excellent PID resistance at 96 hours (@85°C /85%) test, and also can be improved to meet higher standards for the particularly harsh environment.

COMPREHENSIVE CERTIFICATES



First solar company which passed the TUV Nord IEC/TS 62941 certification audit.

For Global Market



ASTRONERGY
A CHNT COMPANY

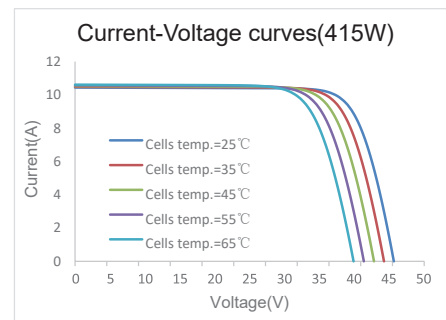
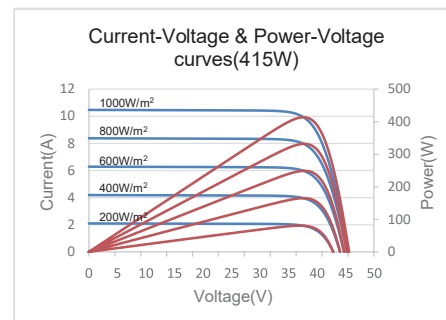
ELECTRICAL SPECIFICATIONS

STC rated output (P_{mpp})*	405 Wp	410 Wp	415 Wp	420 Wp
Rated voltage (V_{mpp}) at STC	41.59 V	41.85 V	42.11 V	42.35 V
Rated current (I_{mpp}) at STC	9.74 A	9.80 A	9.86 A	9.92 A
Open circuit voltage (V_{oc}) at STC	49.53 V	49.80 V	50.06 V	50.32 V
Short circuit current (I_{sc}) at STC	10.31 A	10.38 A	10.45 A	10.52 A
Module efficiency	20.0%	20.3%	20.5%	20.8%
Rated output (P_{mpp}) at NMOT	301.1 Wp	304.8 Wp	308.5 Wp	312.2 Wp
Rated voltage (V_{mpp}) at NMOT	38.61 V	38.84 V	39.08 V	39.31 V
Rated current (I_{mpp}) at NMOT	7.80 A	7.85 A	7.89 A	7.94 A
Open circuit voltage (V_{oc}) at NMOT	46.38 V	46.64 V	46.88 V	47.12 V
Short circuit current (I_{sc}) at NMOT	8.31 A	8.36 A	8.42 A	8.48 A
Temperature coefficient (P_{mpp})	- 0.35%/°C			
Temperature coefficient (I_{sc})	+0.04%/°C			
Temperature coefficient (V_{oc})	- 0.28%/°C			
Nominal module operating temperature (NMOT)	44±2°C			
Maximum system voltage (IEC/UL)	1500V _{DC}			
Number of diodes	3			
Junction box IP rating	IP 68			
Maximum series fuse rating	20 A			

STC: Irradiance 1000W/m², Cell Temperature 25°C, AM=1.5

NMOT: Irradiance 800W/m², Ambient Temperature 20°C, AM=1.5, Wind Speed 1m/s

CURVE



MECHANICAL SPECIFICATIONS

Outer dimensions (L x W x H)	2018 x 1002 x 35 mm
Frame technology	Aluminum, silver anodized
Module composition	Glass / EVA / Backsheet (white)
Front glass thickness	3.2 mm
Cable length (IEC/UL)	Portrait: 350 mm Landscape: 1200 mm
Cable diameter (IEC/UL)	4 mm ² / 12 AWG
① Maximum mechanical test load	5400 Pa (front) / 2400 Pa (back)
Fire performance (IEC/UL)	Class C (IEC) or Type 1 (UL)
Connector type (IEC/UL)	MC4 compatible

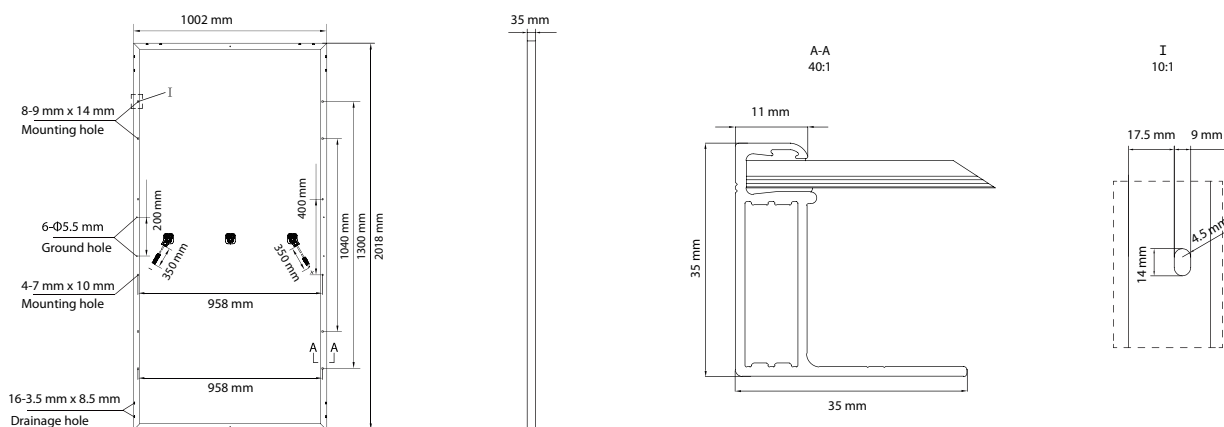
① Refer to Astronergy crystalline installation manual or contact technical department.
Maximum Mechanical Test Load=1.5×Maximum Mechanical Design Load.

PACKING SPECIFICATIONS

① Weight (module only)	22.6 kg
② Packing unit	31 pcs / box
Weight of packing unit (for 40'HQ container)	748 kg
Number of modules per 40'HQ container	682 pcs

① Tolerance +/- 1.0kg
② Subject to sales contract

MODULE DIMENSION DETAILS



HT72-166M

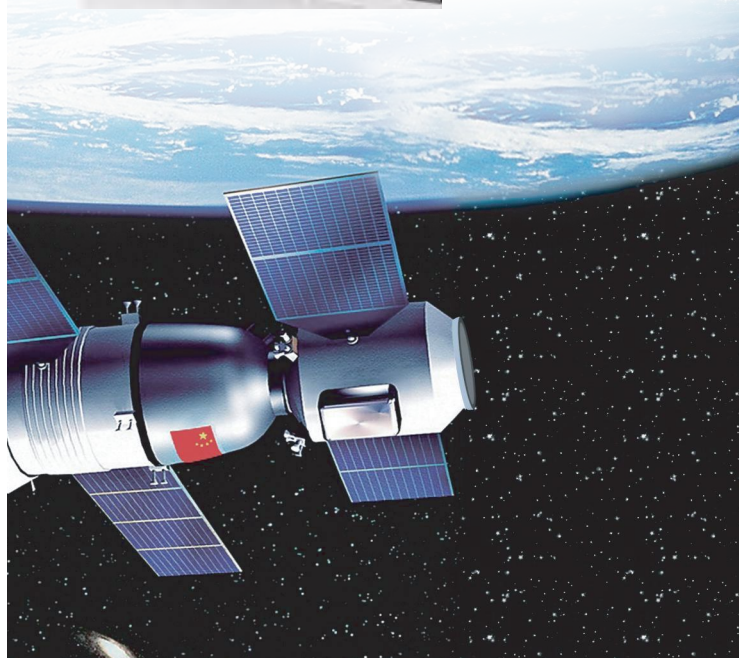
NEW

Big Size: Cell 166*83

435W / 440W 445W / 450W / 455W



- Module Efficiency: 21.2%
- No. of Cells: 144 (6 × 24)
- Weight: 23.5kg
- Dimensions: 2094mm×1038mm×35mm



Shanghai Aerospace Automobile
Electromechanical Co., Ltd.
website: www.ht-saae.com



Factory :
Lianyungang ShenZhou New Energy Co., Ltd.
Turkey HT Solar Energy Joint Stock Company



Half cut cell technology can reduce the internal power loss and improve component overall power. Excellent heat dissipation avoids hot spot production.



9BB The optimized number and width of main gate lines, Maximize the light receiving area of components and Reduce component power consumption

12Ys

Products Warranty

25Ys

Warranty on power output

EL

Microcrack resistant enhance reliability, triple EL tested of high quality control.



Designed for high voltage systems of up to 1500 VDC, increasing the string length of solar systems and saving on BoS costs



All the modules are sorted and packaged by amperage, reducing mismatch losses and maximizing system output.

5W

Positive tolerance 0/+5w guaranteed

PID

PID Resistant



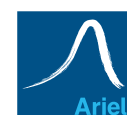
Entire module certified to with stand extreme wind (2400 Pa) and snow loads (5400 Pa)

Comprehensive and first-rate certification system

IEC61215: 2016. IEC61730: 2016 Latest Standard
ISO9001, ISO14001 and OHSAS18001,
meeting the highest international standards
Strict quality control



IEC 61215
IEC 61730
Regular Production
Surveillance
www.tuv.com

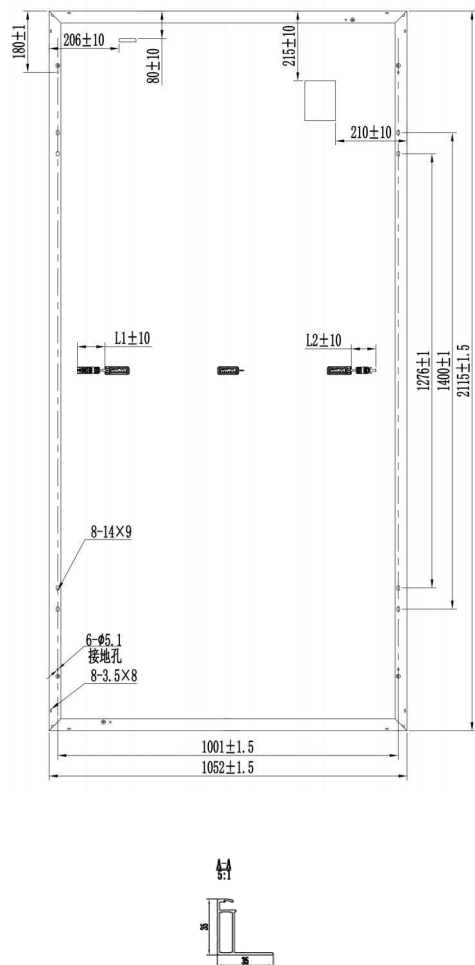


Member Argo Group

MULTIWAY+

435W/440W/445W/450W/455W

Engineering Drawing



Electrical Characteristics

Module	HT72-166M				
Maximum Power at STC(Pmax)	435W	440W	445W	450W	455W
Open-Circuit Voltage(Voc)	49.6V	49.8V	49.9V	50.0V	50.1V
Short-Circuit Current(Isc)	11.53A	11.60A	11.72A	11.83A	11.96A
Optimum Operating Voltage (Vmp)	40.7V	40.9V	41.0V	41.1V	41.2V
Optimum Operating Current(Imp)	10.70A	10.77A	10.86A	10.96A	11.06A
Module Efficiency	20.0%	20.2%	20.5%	20.7%	20.9%
Power Tolerance	0 ~ +5W				
Maximum System Voltage	1000V / 1500V DC(IEC)				
Maximum Series Fuse Rating	15A				
Operating Temperature	-40 °C to +85 °C				

*STC: Irradiance 1000W/m², module temperature 25, AM=1.5
Optional black frame or white frame module according to customer requirements

NMOT

Module	HT72-166M				
Maximum Power	322W	326W	330W	333W	337W
Open Circuit Voltage (Voc)	46.9V	47.1V	47.2V	47.2V	47.3V
Short Circuit Current (Isc)	9.31A	9.37A	9.46A	9.55A	9.66A
Maximum Power Voltage (Vmp)	38.5V	38.6V	38.17V	38.8V	38.9V
Maximum Circuit Current (Imp)	8.36A	8.45A	8.53A	8.58A	8.66A
NOCT	45°C ±2°C				

*NMOT: Irradiance 800W/m², ambient temperature 20 °C, wind speed 1 m/s

Mechanical Characteristics

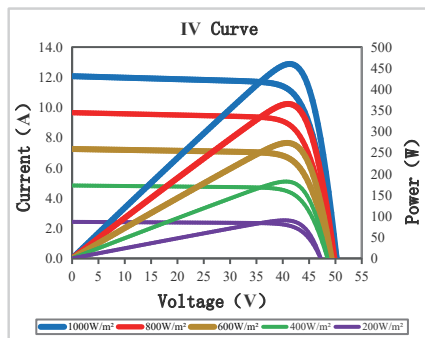
Solar Cells	Monocrystalline 166 × 83 mm
No. of Cells	144 (6 × 24)
Dimensions	2094mm×1038mm×35mm
Weight	24.5 kg
Front Glass	High transmission tempered glass
Frame	Anodized aluminium alloy
Junction Box	IP68
Cable	4mm ² (IEC) Length: (+)200mm,(-)300mm
Connectors	MC4 Compatible
Packaging Configuration	30pcs / box, 660pcs / 40'HQ Container

Temperature Characteristics

Temperature Coefficient of Pmax	γ (Pm)	-0.39%/K
Temperature Coefficient of Voc	β (Voc)	-0.29%/K
Temperature Coefficient of Isc	α (Isc)	0.049%/K

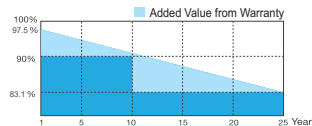
I-V Curves

Current-Voltage & Power-Voltage Curve



Warranty

12-year product warranty
25-year warranty on power output
Specific information is referred to the product quality guarantee



Information Box

Hi-MO 5m

LR5-72HPH 525~550M

- Based on M10-182mm wafer, best choice for ultra-large power plants
- Advanced module technology delivers superior module efficiency
 - M10 Gallium-doped Wafer • Smart Soldering • 9-busbar Half-cut Cell
- Excellent outdoor power generation performance
- High module quality ensures long-term reliability



12-year Warranty for
Materials and Processing



25-year Warranty for Extra
Linear Power Output

Complete System and Product Certifications

IEC 61215, IEC 61730, UL 61730

ISO 9001:2008: ISO Quality Management System

ISO 14001: 2004: ISO Environment Management System

TS62941: Guideline for module design qualification and type approval

OHSAS 18001: 2007 Occupational Health and Safety

LONGi



21.5%
MAX MODULE
EFFICIENCY

0~+5W
POWER
TOLERANCE

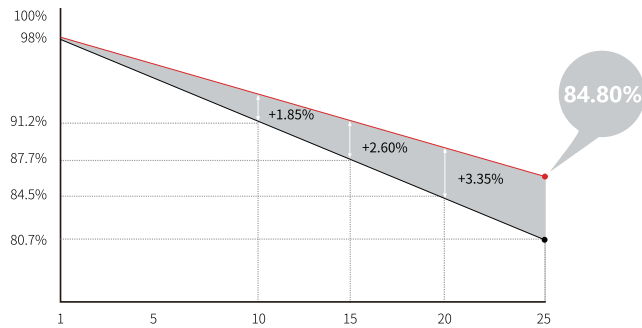
<2%
FIRST YEAR
POWER DEGRADATION

0.55%
YEAR 2-25
POWER DEGRADATION

HALF-CELL
Lower operating temperature

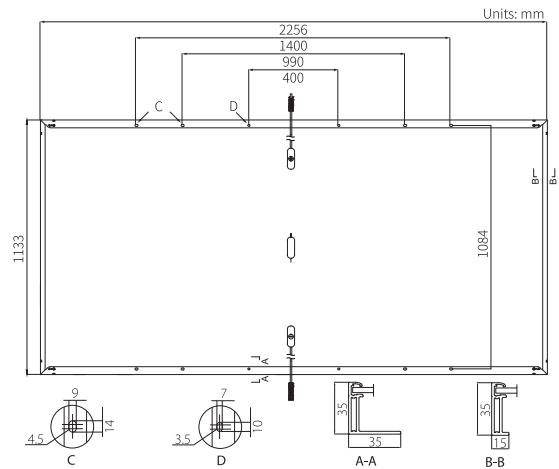
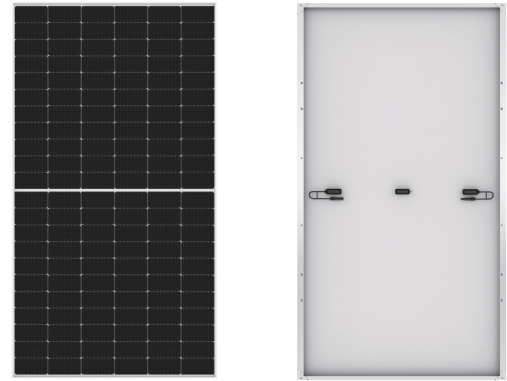
Additional Value

25-Year Power Warranty



Mechanical Parameters

Cell Orientation	144 (6×24)
Junction Box	IP68, three diodes
Output Cable	4mm ² , positive 400 / negative 200mm length can be customized
Glass	Single glass, 3.2mm coated tempered glass
Frame	Anodized aluminum alloy frame
Weight	27.2kg
Dimension	2256×1133×35mm
Packaging	31pcs per pallet / 155pcs per 20' GP / 620pcs per 40' HC



Electrical Characteristics

STC : AM1.5 1000W/m² 25°C

Test uncertainty for Pmax: ±3%

Power Class	525	530	535	540	545	550
Maximum Power (Pmax/W)	525	530	535	540	545	550
Open Circuit Voltage (Voc/V)	49.05	49.20	49.35	49.50	49.65	49.80
Short Circuit Current (Isc/A)	13.65	13.71	13.78	13.85	13.92	13.98
Voltage at Maximum Power (Vmp/V)	41.20	41.35	41.50	41.65	41.80	41.95
Current at Maximum Power (Imp/A)	12.75	12.82	12.90	12.97	13.04	13.12
Module Efficiency(%)	20.5	20.7	20.9	21.1	21.3	21.5

Operating Parameters

Operational Temperature	-40°C ~ +85°C
Power Output Tolerance	0 ~ +5 W
Voc and Isc Tolerance	±3%
Maximum System Voltage	DC1500V (IEC/UL)
Maximum Series Fuse Rating	25A
Nominal Operating Cell Temperature	45±2°C
Protection Class	Class II
Fire Rating	UL type 1 or 2

Mechanical Loading

Front Side Maximum Static Loading	5400Pa
Rear Side Maximum Static Loading	2400Pa
Hailstone Test	25mm Hailstone at the speed of 23m/s

Temperature Ratings (STC)

Temperature Coefficient of Isc	+0.048%/°C
Temperature Coefficient of Voc	-0.270%/°C
Temperature Coefficient of Pmax	-0.350%/°C