

ASTORIOS

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PRODUCT CATALOG

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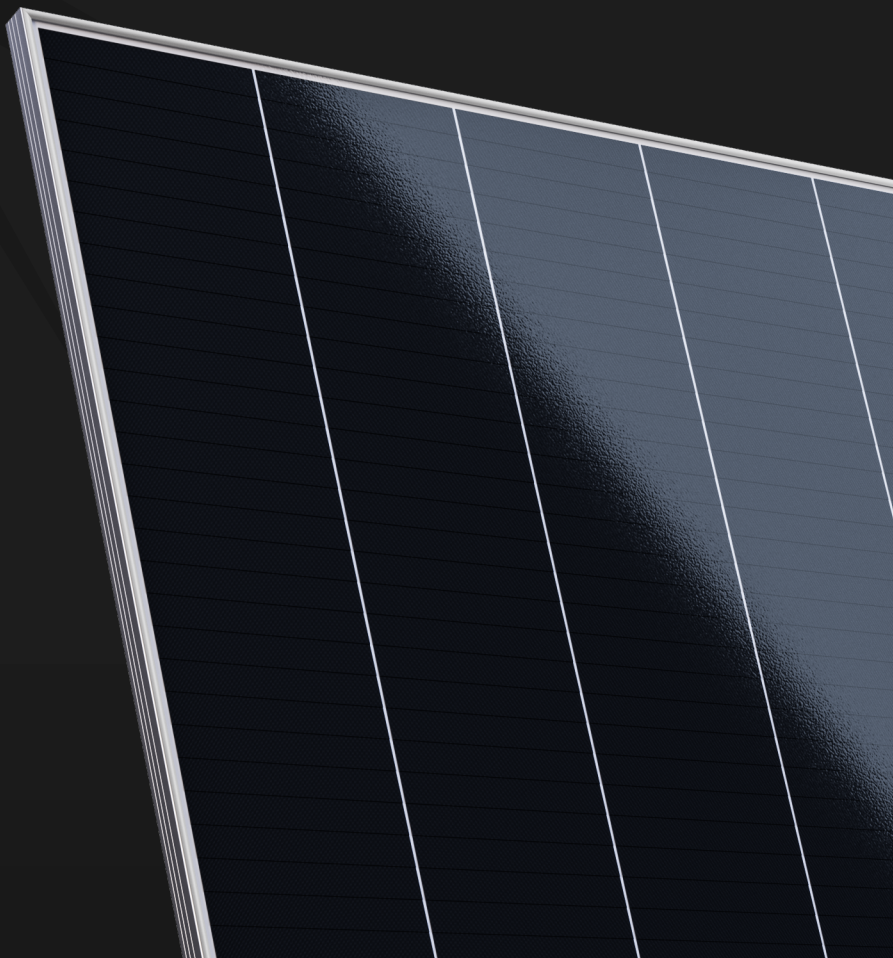
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C&I BATTERY ENERGY STORAGE SYSTEMS

CERTIFICATION



ASTORIOS: Advancing Frontiers

Our Mission

We are determined to pursue perfection in our business by combining advanced technologies in manufacturing unparalleled expertise, and a relentless dedication to customer satisfaction. We aim to deliver tailored solutions for a diverse range of industries, establishing ourselves as a trusted partner in the global market, while upholding the highest standards of quality, sustainability, and innovation. Together, we are creating a more connected and efficient world for generations to come.

Our Vision

Leveraging years of experience and passion for innovation, with commitment to excellence, enduring through challenges, we push the boundaries of what's possible for the brighter future powered by an endless source of energy - the sun.

About Us

ASTORIOS Holding Inc. is an international renewable energy company based in the USA. We specialize in manufacturing and supplying premium quality photovoltaic modules and battery energy storage systems to the global market.

Our commitment to customer satisfaction goes beyond delivering exceptional products; we strive to provide timely support, maintain direct contact, and offer a comprehensive range of services that cater to our clients' unique needs with diligent attention to detail.

ASTORIOS worldwide distributorship network is rapidly expanding, ensuring local sales and tailored services for our diverse customers. Our main sales office managers are always available for direct contact and support, fostering strong relationships with both customers and distributors.

ASTORIOS's photovoltaic modules are certified by all necessary international and local standards for production, quality, safety, management, packaging, and operation. Our manufacturing facilities undergo regular inspections by third-party certifiers, who conduct rigorous production surveillance to ensure compliance with our uncompromising, multi-step quality control process.

We manufacture rooftop, commercial, and utility-scale photovoltaic modules in fully automated, robotized facilities, using the finest raw materials and the most advanced technology available. In addition to our standard offerings, we can also supply customized modules tailored to our clients' specific requirements.

To provide our customers with cutting-edge technology and a variety of photovoltaic module options, we collaborate with leading component suppliers. This enables our global network of distributors to meet the diverse needs of their customers ranging from large utility-scale projects to residential rooftop installations. At ASTORIOS, we are committed to supporting your long-term business growth by providing exceptional products and unparalleled service for you and your customers. Together, we are advancing the renewable energy industry and paving the way for a sustainable future.

TOPCon PV MODULES

Experience the cutting-edge performance of ASTORIOS's N-Type Tunnel Oxide Passivated Contact (TOPCon) PV modules, setting new standards in efficiency, stability, and affordability within the solar industry.

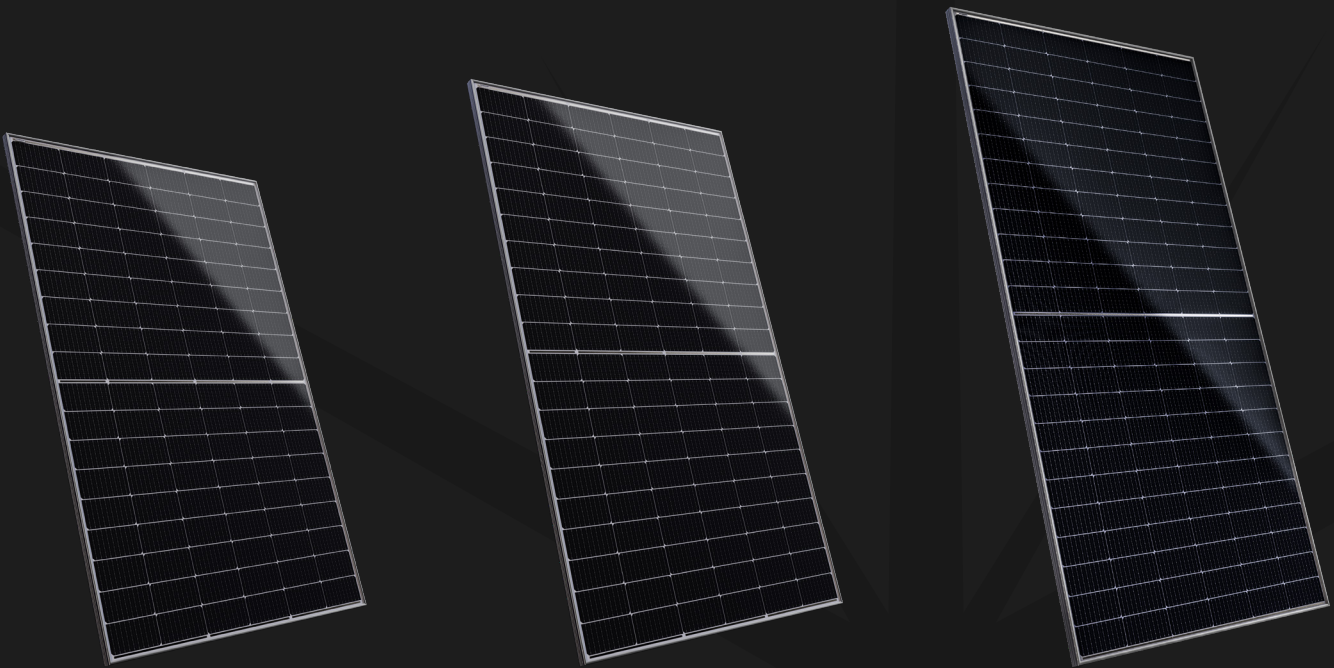
Our TOPCon PV modules boast a remarkable 22.6% maximum module efficiency, making them a highly competitive choice among advanced solar technologies with lower balance of system (BOS) cost, requiring less space and installation effort. TOPCon technology is an efficient choice for a variety of applications with numerous other advantages over conventional solar panel solutions.

The high-performance capabilities of our N-Type TOPCon PV modules make them an attractive investment for both residential and commercial applications. They are especially well-suited for projects requiring maximum energy generation within limited space constraints.

To compare 585 Wp N-Type TOPCon solar panels have the same dimensions as 550 Wp P-Type PERC solar panels.

N-Type TOPCon cells benefit from a unique layer structure that offers superior performance compared to traditional P-type cells, leading to increased efficiency, minimal power losses, and resistance to high temperature, designed to withstand extreme weather conditions, offering reliable performance even in the most challenging environments. These characteristics result in the elimination of potential-induced degradation (PID) and light-induced degradation (LID).

Exceptional longevity and durability are hallmarks of our N-Type TOPCon technology, ensuring that our modules continue to perform optimally over time, providing long-lasting performance and reliability.



ASTR **108HCN/10** Series
410-430 Wp

ASTR **120HCN/10** Series
460-480 Wp

ASTR **144HCND/10** Series
560-580 Wp

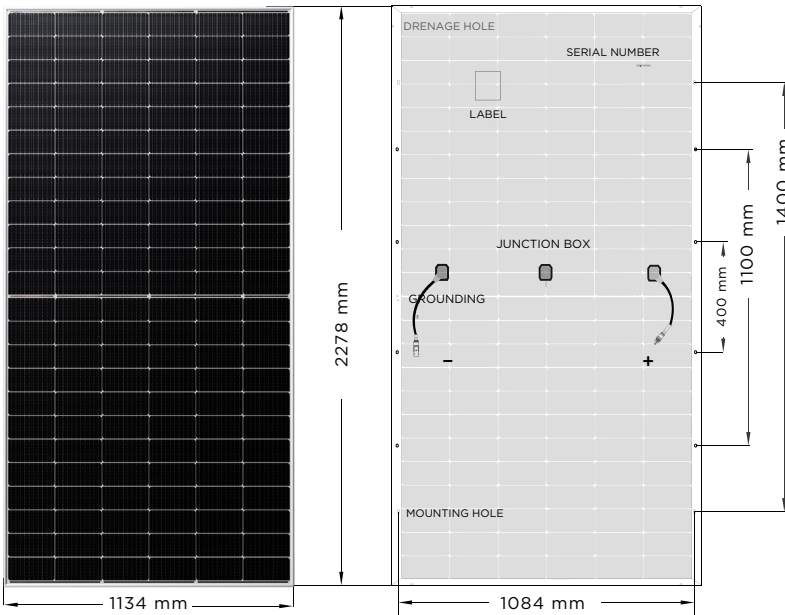


HIGH EFFICIENCY BIFACIAL, DOUBLE GLASS PHOTOVOLTAIC MODULE

ASTR 144HCND/10 Series
560-580 Wp

TOPCON N-TYPE HALF CUT CELLS

22.45%
MAXIMUM MODULE EFFICIENCY



MATERIAL CHARACTERISTICS

Dimensions	2278 x 1134 x 30 mm
Weight	32.0 kg
Number of cells	144 pcs (6x24)
Cells	Mono-crystalline, Half Cut N-Type 10BB / 16BB(182mm)
Glass front/rear	2 mm, High transparency, AR coated
Frame	Silver color, anodized aluminum alloy
Junction box	IP68 Rated, 3 bypass diodes
Connector type	Staubli MC4 (Original)
Cable	4 mm ² , 300 mm

PACKAGING INFORMATION

One pallet quantity	36 pcs
40 ft HC/HQ container	720 pcs

TEMPERATURE PARAMETERS

Temperature Coefficient of Pmax	-0.30 % / °C
Temperature Coefficient of Voc	-0.25 % / °C
Temperature Coefficient of Isc	+0.046 % / °C
Operating Temperature	-40°C to +85 °C
Normal Operating Cell Temperature (NOCT)	44±2°C

MAXIMUM RATINGS

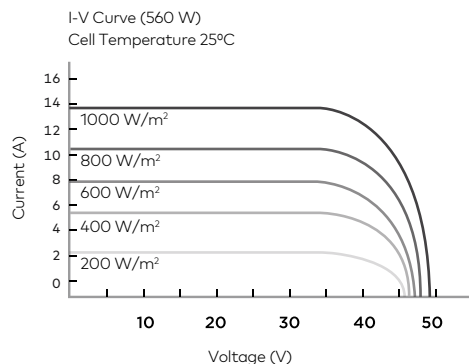
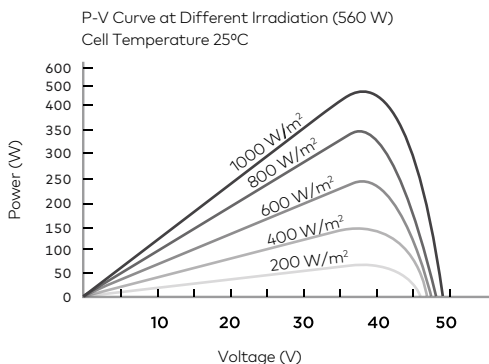
Max. System Voltage	1500V DC -(H)
Max. Series Fuse Rating	30 A
Uplift load (wind)	2400 Pa*
Downforce load (snow)	5400 Pa*

*For more information please refer to Instruction Manual

MODULE TYPE	144HCND/10		560 Wp		565 Wp		570Wp		575 Wp		580 Wp	
	STC	NMOT	STC	NMOT	STC	NMOT	STC	NMOT	STC	NMOT	STC	NMOT
ELECTRICAL CHARACTERISTICS												
Maximum power (Pmax / Wp)	560	421	565	425	570	429	575	432	580	436		
Open circuit voltage (Voc / V)	50.67	48.13	50.87	48.32	51.07	48.51	51.27	48.70	51.47	48.89		
Short circuit current (Isc / A)	14.13	11.41	14.19	11.46	14.25	11.50	14.31	11.55	14.37	11.60		
Maximum power voltage (Vmp / V)	41.95	39.39	42.14	39.52	42.29	39.65	42.44	39.78	42.59	39.87		
Maximum power current (Imp / A)	13.35	10.69	13.41	10.75	13.48	10.81	13.55	10.87	13.62	10.94		
Module efficiency at STC (ηm / %)	21.68		21.87		22.07		22.26		22.45			
Power tolerance (Pmax)	(0,+5) Wp											

STC: Irradiance of 1000 W/m² with spectrum AM 1.5 and a module temperature of 25°C

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



30 YEARS
Performance Guarantee

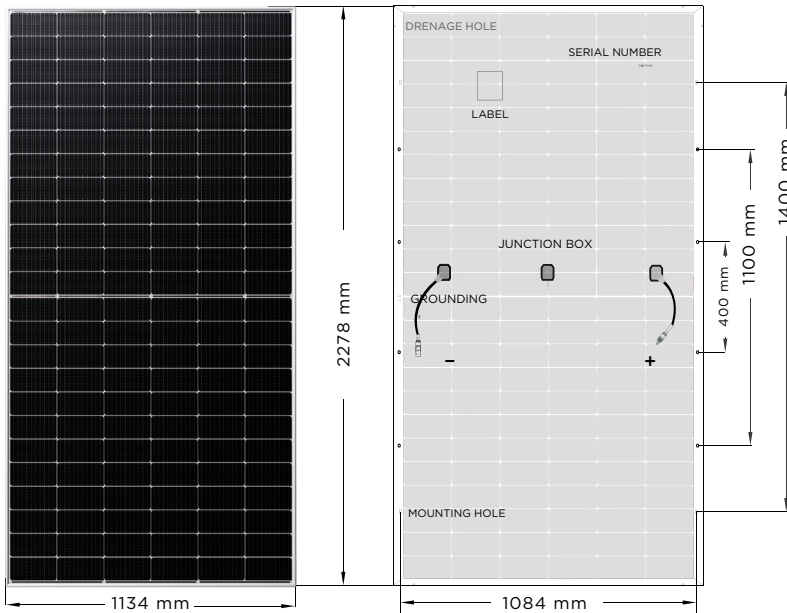
20 YEARS
Product Warranty

HIGH EFFICIENCY PHOTOVOLTAIC MODULE

ASTR 144HCN/10 Series
565-585 Wp

TOPCON N-TYPE HALF CUT CELLS

22.65%
MAXIMUM MODULE EFFICIENCY



MATERIAL CHARACTERISTICS

Dimensions	2278 x 1134 x 35 mm
Weight	29.4 kg
Number of cells	144 pcs (6x24)
Cells	Mono-crystalline, Half Cut N-Type 10BB / 16BB (182mm)
Glass	3.2 mm, High transparency, AR coated
Frame	Silver color, Anodized aluminum alloy
Junction box	IP68 Rated, 3 bypass diodes
Connector type	Staubli MC4 (Original)
Cable	4 mm ² , 300 mm

PACKAGING INFORMATION

One pallet quantity	31 pcs
40 ft HC/HQ container	620 pcs

TEMPERATURE PARAMETERS

Temperature Coefficient of Pmax	-0.29 % / °C
Temperature Coefficient of Voc	-0.25 % / °C
Temperature Coefficient of Isc	+0.045 % / °C
Operating Temperature	-40°C to +85 °C
Normal Operating Cell Temperature (NOCT)	44±2°C

MAXIMUM RATINGS

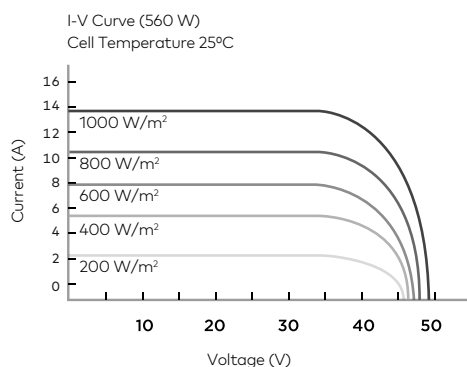
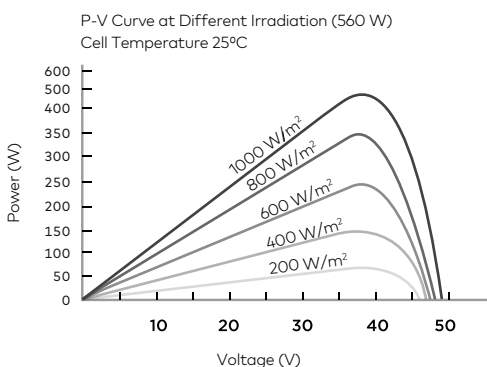
Max. System Voltage	1500V DC -(H)
Max. Series Fuse Rating	25 A
Uplift load (wind)	2400 Pa*
Downforce load (snow)	5400 Pa*

*For more information please refer to Instruction Manual

MODULE TYPE	144HCN/10		565 Wp		570 Wp		575Wp		580 Wp		585 Wp	
	STC	NMOT	STC	NMOT	STC	NMOT	STC	NMOT	STC	NMOT	STC	NMOT
ELECTRICAL CHARACTERISTICS												
Maximum power (Pmax / Wp)	565	425	570	429	575	432	580	436	585	440		
Open circuit voltage (Voc / V)	50.60	48.06	50.74	48.20	50.88	48.33	51.02	48.46	51.16	48.60		
Short circuit current (Isc / A)	14.23	11.49	14.31	11.55	14.39	11.62	14.47	11.68	14.55	11.75		
Maximum power voltage (Vmp / V)	41.92	39.38	42.07	39.51	42.22	39.60	42.37	39.69	42.52	39.81		
Maximum power current (Imp / A)	13.48	10.79	13.55	10.85	13.62	10.92	13.69	10.99	13.76	11.05		
Module efficiency at STC (ηm / %)	21.87		22.07		22.26		22.45		22.65			
Power tolerance (Pmax)	(0,+5) Wp											

STC: Irradiance of 1000 W/m² with spectrum AM 1.5 and a module temperature of 25°C

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



30 YEARS
Performance Guarantee

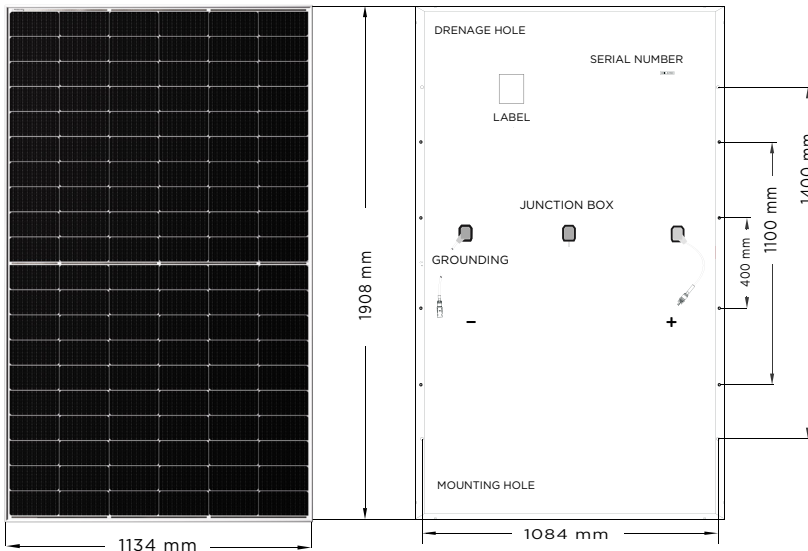
15 YEARS
Product Warranty

HIGH EFFICIENCY PHOTOVOLTAIC MODULE

ASTR 120HCN/10 Series
460-480 Wp

TOPCON N-TYPE HALF CUT CELLS

22.18%
MAXIMUM MODULE EFFICIENCY



MATERIAL CHARACTERISTICS

Dimensions	1908 x 1134 x 30 mm
Weight	24.0 kg
Number of cells	120 pcs (6x20)
Cells	Mono-crystalline, Half Cut N-Type 16BB/10 BB (182 mm)
Glass	3.2 mm, High transparency, AR coated
Frame	Silver color, Anodized aluminum alloy
Junction box	IP68 Rated, 3 bypass diodes
Connector type	Staubli MC4 (Original)
Cable	4 mm ² , 300 mm

PACKAGING INFORMATION

One pallet quantity	36 pcs
40 ft HC/HQ container	864 pcs

TEMPERATURE PARAMETERS

Temperature Coefficient of Pmax	-0.30 % / °C
Temperature Coefficient of Voc	-0.25 % / °C
Temperature Coefficient of Isc	+0.046 % / °C
Operating Temperature	-40°C to +85 °C
Normal Operating Cell Temperature (NOCT)	44±2°C

MAXIMUM RATINGS

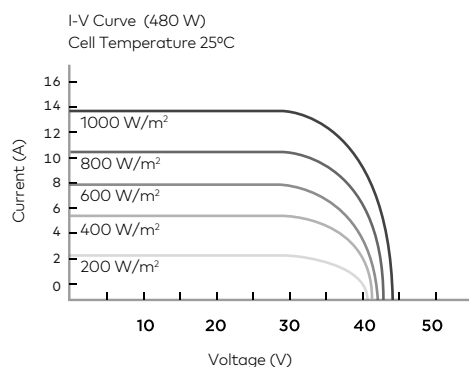
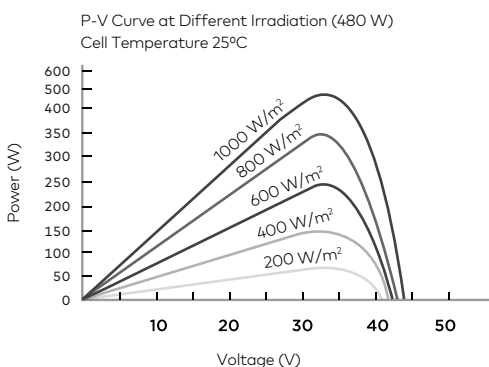
Max. System Voltage	1500V DC -(H)
Max. Series Fuse Rating	20 A
Uplift load (wind)	2400 Pa*
Downforce load (snow)	5400 Pa*

*For more information please refer to Instruction Manual

MODULE TYPE	120HCN/10		460 Wp		465 Wp		470 Wp		475 Wp		480 Wp	
	STC	NMOT	STC	NMOT	STC	NMOT	STC	NMOT	STC	NMOT	STC	NMOT
ELECTRICAL CHARACTERISTICS												
Maximum power (Pmax / Wp)	460	346	465	350	470	353	475	357	480	361		
Open circuit voltage (Voc / V)	42.05	39.94	42.22	40.10	42.38	40.25	42.54	40.41	42.71	40.57		
Short circuit current (Isc / A)	13.99	11.29	14.07	11.36	14.15	11.42	14.23	11.49	14.31	11.55		
Maximum power voltage (Vmp / V)	34.72	32.62	34.89	32.77	35.05	32.94	35.21	33.10	35.38	33.27		
Maximum power current (Imp / A)	13.25	10.61	13.33	10.67	13.41	10.73	13.49	10.79	13.57	10.85		
Module efficiency at STC (ηm / %)	21.26		21.49		21.72		21.95		22.18			
Power tolerance (Pmax)	(0,+5) Wp											

STC: Irradiance of 1000 W/m² with spectrum AM 1.5 and a module temperature of 25°C

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



30 YEARS
Performance Guarantee

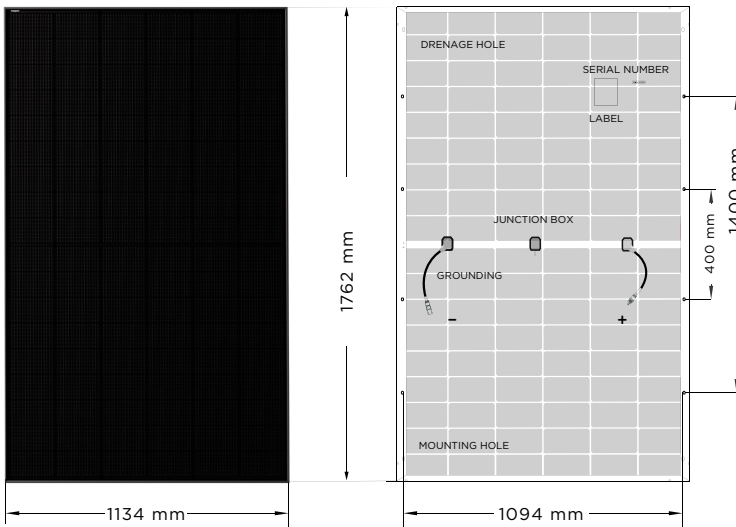
15 YEARS
Product Warranty

ULTRA BLACK HIGH EFFICIENCY BIFACIAL, DOUBLE GLASS PHOTOVOLTAIC MODULE

ASTR 108HCND/10 Series
425-445 Wp

TOPCON N-TYPE HALF CUT CELLS

22.27% MAXIMUM MODULE EFFICIENCY



MATERIAL CHARACTERISTICS

Dimensions	1762 x 1134 x 30 mm (1.998 m ²)
Weight	22.5 kg
Number of cells	108 pcs (6x18)
Cells Type	Mono-crystalline, Half Cut N-Type 16BB/10 BB (186x182 mm)
Glass front/back	2 mm, High transparency, AR coated
Frame	Black color, Anodized aluminum alloy
Junction box	IP68 Rated, 3 bypass diodes
Connector type	Staubli MC4 (Original)
Cable	4 mm ² , 300 mm

PACKAGING INFORMATION

One pallet quantity	36 pcs
40 ft HC/HQ container	936 pcs

TEMPERATURE PARAMETERS

Temperature Coefficient of Pmax	-0.30 % / °C
Temperature Coefficient of Voc	-0.25 % / °C
Temperature Coefficient of Isc	+0.046 % / °C
Operating Temperature	-40°C to +85 °C
Normal Operating Cell Temperature (NOCT)	44±2°C

MAXIMUM RATINGS

Max. System Voltage	1500V DC -(H)
Max. Series Fuse Rating	25 A
Uplift load (wind)	2400 Pa*
Downforce load (snow)	5400 Pa*

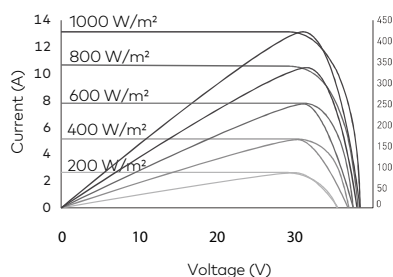
*For more information please refer to Instruction Manual

MODULE TYPE	108HCND/10		425 Wp		430 Wp		435 Wp		440 Wp		445 Wp	
	STC	NOCT	STC	NOCT	STC	NOCT	STC	NOCT	STC	NOCT	STC	NOCT
ELECTRICAL CHARACTERISTICS												
Maximum power (Pmax / Wp)	425	320	430	323	435	327	440	331	445	335		
Open circuit voltage (Voc / V)	38.75	36.81	38.95	37.00	39.16	37.20	39.38	37.41	39.59	37.61		
Short circuit current (Isc / A)	13.66	11.03	13.73	11.09	13.80	11.14	13.86	11.19	13.93	11.25		
Maximum power voltage (Vmp / V)	32.18	29.99	32.38	30.10	32.59	30.33	32.81	30.56	33.02	30.76		
Maximum power current (Imp / A)	13.21	10.67	13.28	10.73	13.35	10.78	13.41	10.83	13.48	10.89		
Module efficiency at STC (ηm / %)	21.27		21.52		21.77		22.02		22.27			
Power tolerance (Pmax)	(0,+5) Wp											

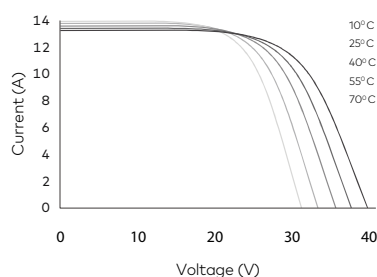
STC: Irradiance of 1000 W/m² with spectrum AM 1.5 and a module temperature of 25°C

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

I-V/P-V Curve at Different Irradiation (420W)
Cell temperature 25°C



I-V Curve at Different Temperature (420W)
Irradiation 1000 W/m²



30 YEARS
Performance Guarantee

20 YEARS
Product Warranty

IBC PV MODULES

ASTORIOS's advanced Interdigitated Back Contact (IBC) PV modules showcase an advanced design that delivers an impressive efficiency of up to 22.1%, making them one of the most sophisticated and high-performing commercially manufactured solar modules available today.

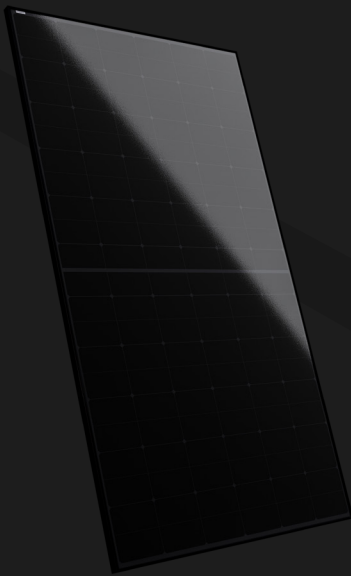
Design of IBC modules eliminates front-side contacts, increasing the active cell area for higher efficiency. Our modules feature high-conductivity busbars that reduce internal resistances, further enhancing performance. The cutting-edge gapless layout, with a cell spacing of -0.3mm , maximizes module area utilization, leading to higher efficiency and energy generation.

ASTORIOS's IBC PV modules are backed by a robust 30-year product and performance warranty, guaranteeing a maximum degradation rate of just 0.25% per year. This industry-leading power stability ensures 93% performance at the 25th year, providing long-lasting reliability and return on investment.

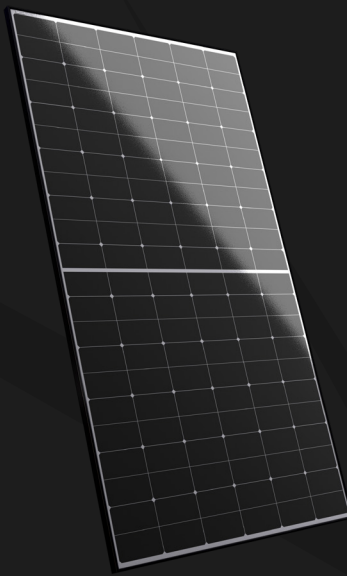
IBC technology effectively addresses the issue of hot spots, which are a major factor in module degradation. Unlike conventional cells that can reach dangerously high temperatures when bypass diodes fail, IBC cells have a low breakdown voltage and distributed junction design, allowing for superior hot spot temperature control.

The optimized temperature coefficient of $-0.29\%/^{\circ}\text{C}$ in our IBC modules enables greater energy generation as temperatures rise. In fact, IBC modules reduce power loss by 30-50% compared to PERC modules. This advanced technology results in an impressive 19.88% increase in power generation and savings from the same area compared to conventional panels.

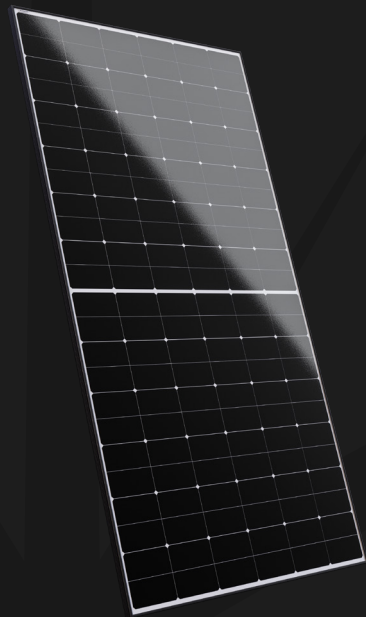
Experience the future of solar energy with ASTORIOS's high-efficiency IBC PV modules, designed to deliver unparalleled performance, reliability, and long-term value for a more sustainable world.



ASTR **IBC-132BD** Series
410-420 Wp



ASTR **IBC-132M** Series
425-435 Wp



ASTR **IBC-144M** Series
460-470 Wp

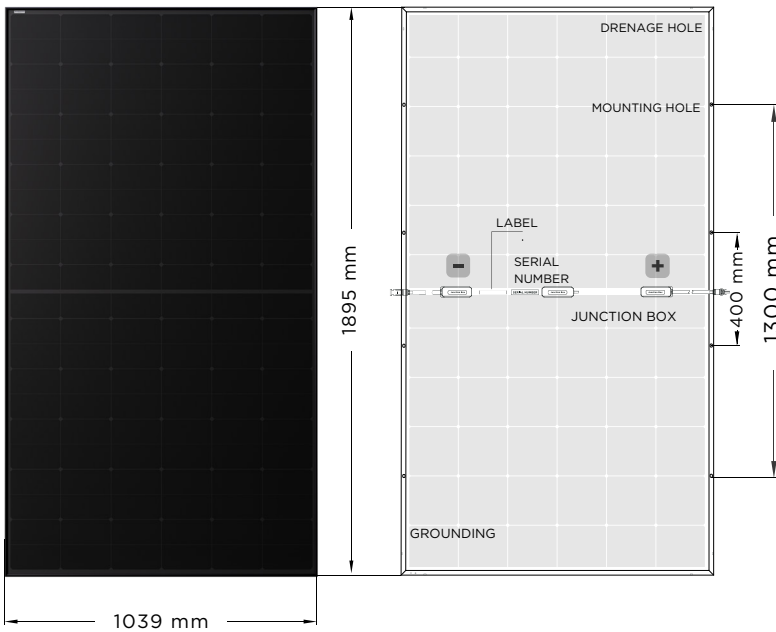


BIFACIAL, DOUBLE GLASS PHOTOVOLTAIC MODULE

ASTR IBC-132BD Series
420-430 Wp

N-TYPE
INTERDIGITATED BACK CONTACT CELLS

21.8%
MAXIMUM MODULE EFFICIENCY



MATERIAL CHARACTERISTICS

Dimensions	1895x1039x30 mm (1.969 m ²)
Weight	26 kg
Glass front/rear	2 mm half tempered glass, low iron
Cells	Bifacial, Half Cut N-Type IBC 166x83 mm
Cells layout	132 pcs (6x22)
Frame	Black color, Anodized aluminum alloy
Junction box	IP 68 rated, 3 bypass diodes
Output cable	4 mm ² , 1400 mm, customizable
Connector	Staubli MC4 (Original)

PACKAGING INFORMATION

One pallet quantity	35 pcs
40 ft HC/HQ container	840 pcs

TEMPERATURE PARAMETERS

Temperature Coefficient of Pmax	-0.29 % / °C
Temperature Coefficient of Voc	-0.246 % / °C
Temperature Coefficient of Isc	+0.046 % / °C
Operating Temperature	-40°C to +85 °C

MAXIMUM RATINGS

Max. System Voltage	1500V DC (IEC)
Max. Series Fuse Rating	20A
Uplift load (wind)	2400 Pa*
Downforce load (snow)	5400 Pa*
Hail Resistance	Max. diameter 25mm, impact speed 23m/s

*For more information please refer to Instruction Manual

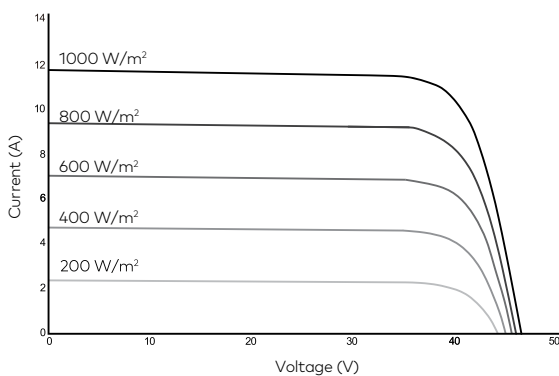
MODULE TYPE	IBC-132BD	420 Wp			425 Wp			430 Wp		
		STC	*10%	*20%	STC	*10%	*20%	STC	*10%	*20%
ELECTRICAL CHARACTERISTICS										
Maximum power (Pmax / Wp)		420	451.5	483	425	456.9	488.8	430	462.3	494.5
Open circuit voltage (Voc / V)			45.9			46.0			46.1	
Short circuit current (Isc / A)		11.61	12.53	13.41	11.76	12.64	13.52	11.86	12.75	13.64
Maximum power voltage (Vmp / V)			38.8			39.0			39.2	
Maximum power current (Imp / A)		10.83	11.64	12.45	10.9	11.72	12.54	10.97	11.8	12.62
Module efficiency at STC (ηm / %)		21.3	22.9	24.5	21.6	23.2	24.8	21.8	23.3	25.1
Power tolerance (Pmax)		(0,+5) Wp								

STC: Irradiance of 1000 W/m² with spectrum AM 1.5 and a module temperature of 25°C

*10% is the Irradiance from rear side: 100 W/m²

*20% is the Irradiance from rear side: 200 W/m²

I-V Curves (425 W)



30 YEARS
Performance Guarantee

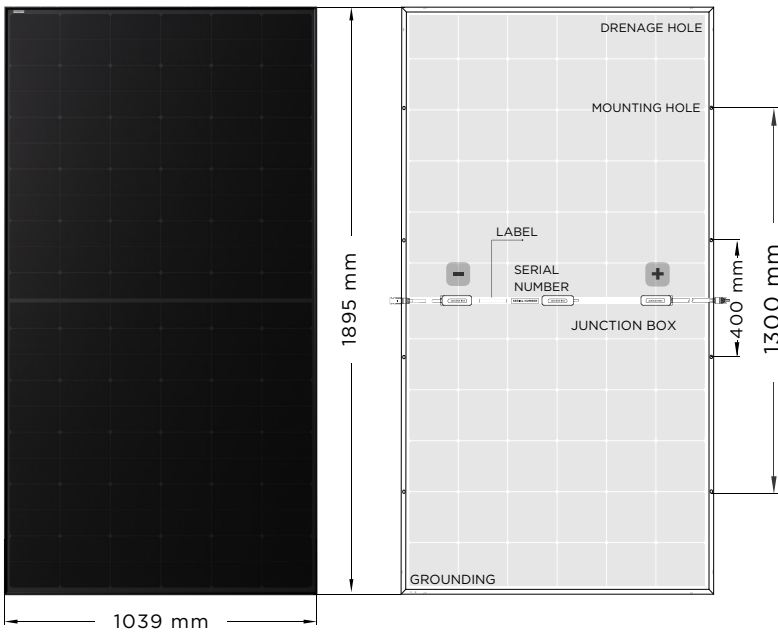
30 YEARS
Product Warranty

ULTRA BLACK BIFACIAL, DOUBLE GLASS PHOTOVOLTAIC MODULE

ASTR IBC-132BD Series
410-420 Wp

N-TYPE
INTERDIGITATED BACK CONTACT CELLS

21.3%
MAXIMUM MODULE EFFICIENCY



MATERIAL CHARACTERISTICS

Dimensions	1895x1039x30 mm (1.969 m ²)
Weight	26 kg
Glass front/rear	2 mm half tempered glass, low iron
Cells	Bifacial, Half Cut N-Type IBC 166x83 mm
Cells layout	132 pcs (6x22)
Frame	Black color, Anodized aluminum alloy
Junction box	IP 68 rated, 3 bypass diodes
Output cable	4 mm ² , 1400 mm, customizable
Connector	Staubli MC4 (Original)

TEMPERATURE PARAMETERS

Temperature Coefficient of Pmax	-0.29 % / °C
Temperature Coefficient of Voc	-0.246 % / °C
Temperature Coefficient of Isc	+0.046 % / °C
Operating Temperature	-40°C to +85 °C

MAXIMUM RATINGS

Max. System Voltage	1500V DC (IEC)
Max. Series Fuse Rating	20A
Uplift load (wind)	2400 Pa*
Downforce load (snow)	5400 Pa*
Hail Resistance	Max. diameter 25mm, impact speed 23m/s

*For more information please refer to Instruction Manual

PACKAGING INFORMATION

One pallet quantity	35 pcs
40 ft HC/HQ container	840 pcs

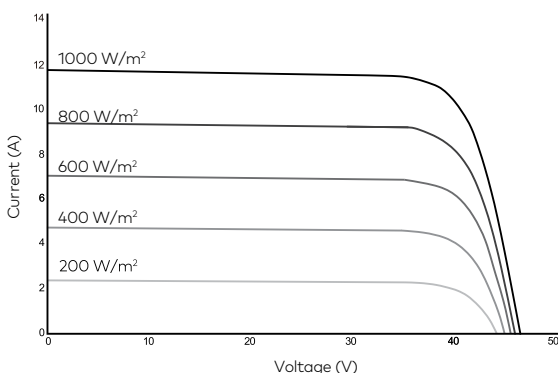
MODULE TYPE	IBC-132BD			410 Wp			415 Wp			420 Wp		
	STC	*10%	*20%	STC	*10%	*20%	STC	*10%	*20%	STC	*10%	*20%
Maximum power (Pmax / Wp)	410	440.8	471.5	415	446.1	477.3	420	451.5	483			
Open circuit voltage (Voc / V)		45.7			45.8			45.9				
Short circuit current (Isc / A)	11.46	12.32	13.18	11.56	12.43	13.29	11.66	12.53	13.41			
Maximum power voltage (Vmp / V)		38.4			38.6			38.8				
Maximum power current (Imp / A)	10.69	11.49	12.29	10.76	11.57	12.37	10.83	11.64	12.45			
Module efficiency at STC (ηm / %)	20.8	22.4	23.9	21.1	22.7	24.3	21.3	23.9	24.5			
Power tolerance (Pmax)	(0,+5) Wp											

STC: Irradiance of 1000 W/m² with spectrum AM 1.5 and a module temperature of 25°C

*10% is the Irradiance from rear side: 100 W/m²

*20% is the Irradiance from rear side: 200 W/m²

I-V Curves (420 W)



30 YEARS
Performance Guarantee

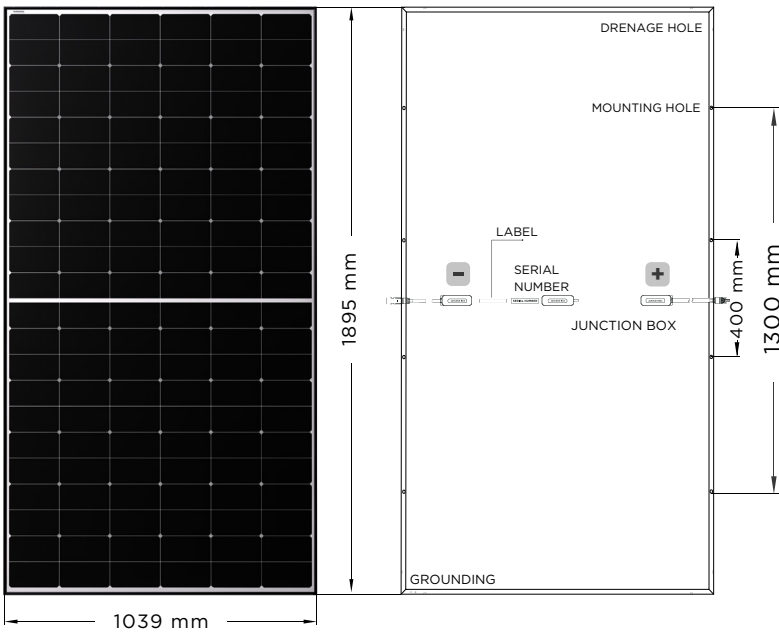
30 YEARS
Product Warranty

BLACK FRAME HIGH EFFICIENCY PHOTOVOLTAIC MODULE

ASTR IBC-132M Series
425-435 Wp

N-TYPE
INTERDIGITATED BACK CONTACT CELLS

22.1%
MAXIMUM MODULE EFFICIENCY



MATERIAL CHARACTERISTICS

Dimensions	1895x1039x35 mm (1.969 m ²)
Weight	21 kg
Glass	3.2 mm coated tempered glass, low iron
Cells	Mono-crystalline, Half Cut N-Type IBC 166x83 mm
Cells layout	132 pcs (6x22)
Frame	Black color, Anodized aluminum alloy
Junction box	IP 68 rated, 3 bypass diodes
Output cable	4 mm ² , 1400 mm, customizable
Connector	Staubli MC4 (Original)

TEMPERATURE PARAMETERS

Temperature Coefficient of Pmax	-0.29 % / °C
Temperature Coefficient of Voc	-0.246 % / °C
Temperature Coefficient of Isc	+0.046 % / °C
Operating Temperature	-40°C to +85 °C

MAXIMUM RATINGS

Max. System Voltage	1500V DC (IEC)
Max. Series Fuse Rating	20A
Uplift load (wind)	2400 Pa*
Downforce load (snow)	5400 Pa*
Hail Resistance	Max. diameter 25mm, impact speed 23m/s

*For more information please refer to Instruction Manual

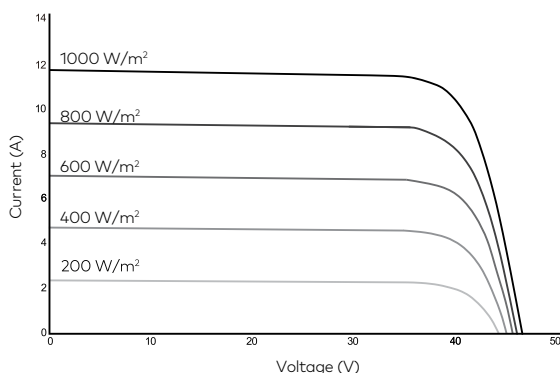
PACKAGING INFORMATION

One pallet quantity	31 pcs
40 ft HC/HQ container	768 pcs

MODULE TYPE	IBC-132M		425 Wp		430 Wp		435 Wp	
	STC	NOCT	STC	NOCT	STC	NOCT	STC	NOCT
Maximum power (Pmax / Wp)	425	316	425	316	430	324	435	328
Open circuit voltage (Voc / V)	46.0	44.0	46.0	44.0	46.1	44.2	46.2	44.3
Short circuit current (Isc / A)	11.76	9.42	11.76	9.42	11.86	9.57	11.96	9.65
Maximum power voltage (Vmp / V)	39.0	36.2	39.0	36.2	39.2	36.6	39.4	36.8
Maximum power current (Imp / A)	10.90	8.73	10.90	8.73	10.97	8.86	11.04	8.92
Module efficiency at STC (ηm / %)	21.6		21.6		21.8		22.1	
Power tolerance (Pmax)					(0,+5) Wp			

STC: Irradiance of 1000 W/m² with spectrum AM 1.5 and a module temperature of 25°C
NOCT: Irradiance 800 W/m², ambient temperature 20°C and wind speed 1 m/s

I-V Curves (425 W)



30 YEARS
Performance Guarantee

25 YEARS
Product Warranty

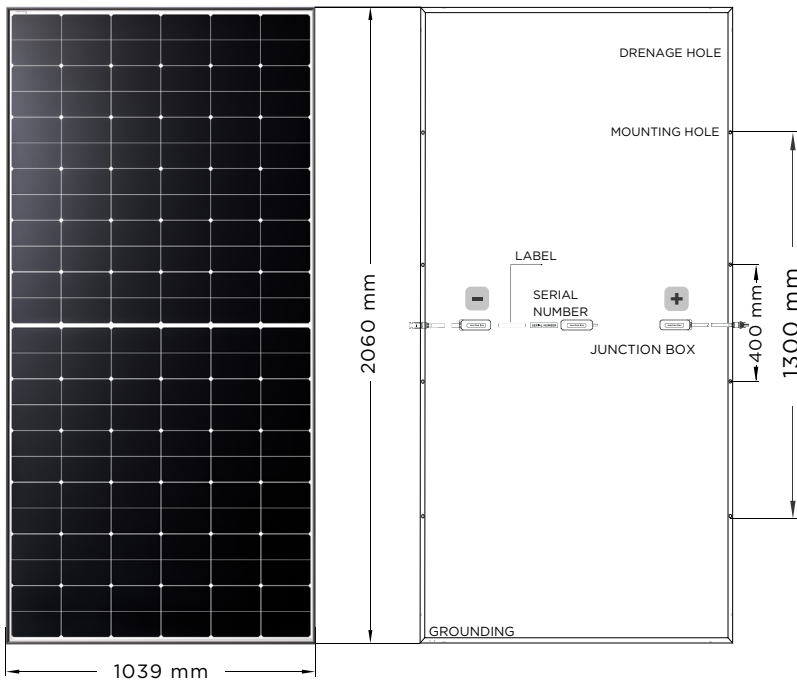
BLACK FRAME HIGH EFFICIENCY PHOTOVOLTAIC MODULE

ASTR IBC-144M Series
460-470 Wp

N-TYPE
INTERDIGITATED BACK CONTACT CELLS

22.0%

MAXIMUM MODULE EFFICIENCY



MATERIAL CHARACTERISTICS

Dimensions	2060x1039x35 mm
Weight	22.5 kg
Glass	3.2 mm, coated tempered glass, low iron
Cells	Mono-crystalline, Half Cut N-Type IBC 166x83 mm
Cells layout	144 pcs (6x24)
Frame	Black color, Anodized aluminum alloy
Junction box	IP 68 rated, 3 bypass diodes
Output cable	4 mm ² , 1600 mm, customizable
Connector	Staubli MC4 (Original)

TEMPERATURE PARAMETERS

Temperature Coefficient of Pmax	-0.29 % / °C
Temperature Coefficient of Voc	-0.246 % / °C
Temperature Coefficient of Isc	+0.046 % / °C
Operating Temperature	-40°C to +85 °C

MAXIMUM RATINGS

Max. System Voltage	1500V DC (IEC)
Max. Series Fuse Rating	20A
Uplift load (wind)	2400 Pa*
Downforce load (snow)	5400 Pa*
Hail Resistance	Max. diameter 25mm, impact speed 23m/s

*For more information please refer to Instruction Manual

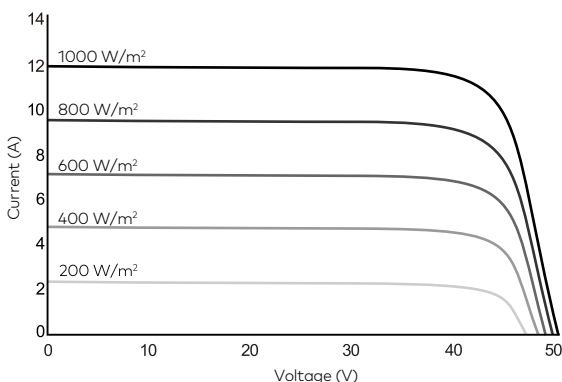
PACKAGING INFORMATION

One pallet quantity	31 pcs
40 ft HC/HQ container	704 pcs

MODULE TYPE	IBC-144M		460 Wp		465 Wp		470 Wp	
	STC	NOCT	STC	NOCT	STC	NOCT	STC	NOCT
Maximum power (Pmax / Wp)	460	346	465	350	470	354		
Open circuit voltage (Voc / V)	50.1	48.0	50.2	48.1	50.3	48.2		
Short circuit current (Isc / A)	11.69	9.45	11.79	9.53	11.88	9.59		
Maximum power voltage (Vmp / V)	42.4	39.5	42.6	39.7	42.8	39.9		
Maximum power current (Imp / A)	10.85	8.76	10.92	8.82	10.98	8.88		
Module efficiency at STC (ηm / %)	21.5		21.7		22.0			
Power tolerance (Pmax)					(0,+5) Wp			

STC: Irradiance of 1000 W/m² with spectrum AM 1.5 and a module temperature of 25°C
NOCT: Irradiance 800 W/m², ambient temperature 20°C and wind speed 1 m/s

I-V Curves (470 W)



30 YEARS
Performance Guarantee

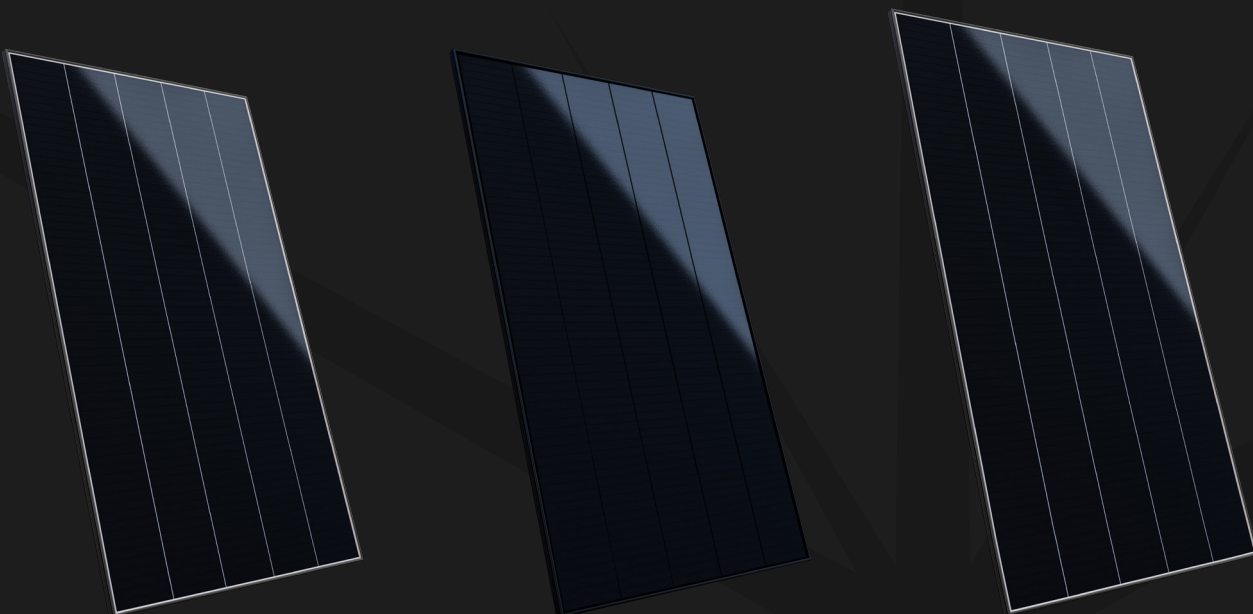
25 YEARS
Product Warranty

SHINGLED PV MODULES (P-TYPE, PERC)

An innovative technology of cutting and bonding PV cells is applied to increase density and efficiency of solar panels. The technology provides the highest density of cell distribution on the module surface, achieving high efficiency of up to 21.7%. The PV modules look high-tech and solid due to the absence of visible buses and gaps between cells.

Passivated Emitter Rear Contact (PERC) Shingled cells technology features an ingenious design where solar cells are arranged in an overlapping pattern, similar to roof shingles. This unique layout maximizes the active cell area and reduces electrical losses, resulting in higher energy output and efficiency. Additionally, the absence of traditional busbars and the use of conductive adhesives reduce the risk of micro-cracks and other potential defects, ensuring exceptional module durability and longevity.

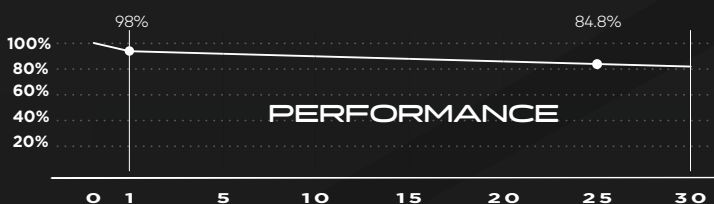
The PV modules are less affected by partial shading and more efficient throughout the day due to the full parallel connection of bonded cells. All solar modules undergo sorting based on current indicators to prevent mismatches in generation and subsequent degradation, have been tested and certified according to international standards for resistance to sand, dust, ammonia, and salt corrosion, making them suitable for operation in the most challenging environmental conditions.



ASTR **MB7-44SC** Series
400-430 Wp

ASTR **MB7-44SCF** Series
400-425 Wp

ASTR **MB7-46SCS** Series
420-445 Wp

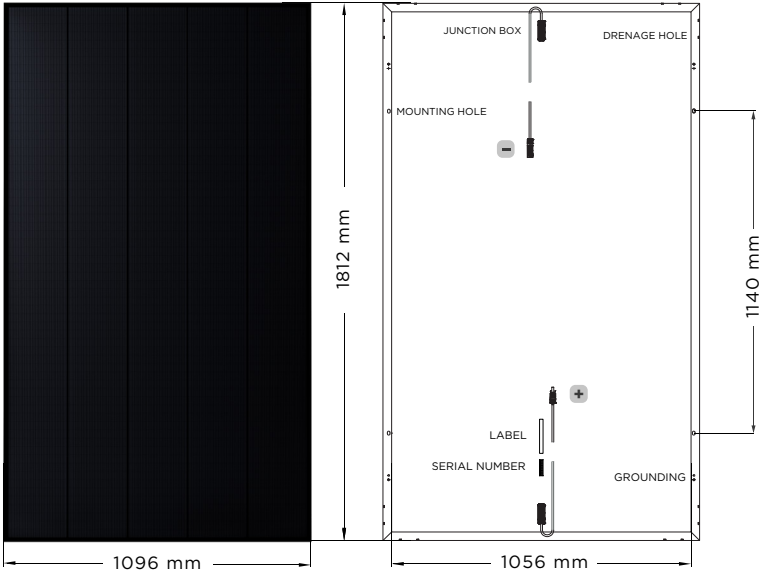


ULTRA BLACK PHOTOVOLTAIC MODULE

ASTR MB7-44SCF Series
400-425 Wp

SHINGLED PERC CELLS

21.4 %
MAXIMUM MODULE EFFICIENCY



MATERIAL CHARACTERISTICS

Dimensions	1812x1096x30 mm (1.986 m ³)
Weight	20.8 kg
Glass	3.2 mm AR coated tempered glass, low iron
Cells	Mono-crystalline, PERC Shingled
Cell layout	305 pcs (61x5)
Frame	Black color, Anodized aluminum alloy
Junction box	IP 68 rated, 2 bypass diodes
Output cable	4 mm ² , +300 mm/-1000 mm (Vertical), +220 mm/-180 mm (Horizontal)
Connector	Staubli MC4 (Original)

PACKAGING INFORMATION

One pallet quantity	36 pcs
40 ft HC/HQ container	924 pcs

TEMPERATURE PARAMETERS

Temperature Coefficient of Pmax	-0.34 % / °C
Temperature Coefficient of Voc	-0.27 % / °C
Temperature Coefficient of Isc	+0.04 % / °C
Operating Temperature	-40°C to +85 °C
Nominal Module Operating Temperature (NMOT)	42.3±2°C

MAXIMUM RATINGS

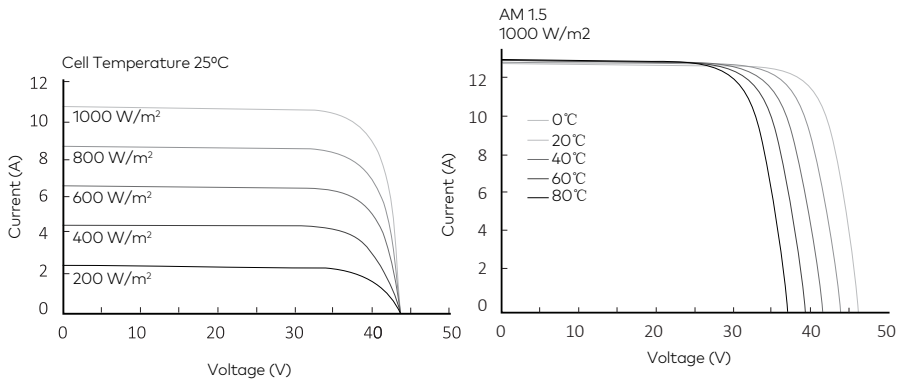
Max. System Voltage	1500V DC (IEC)
Max. Series Fuse Rating	25A
Uplift load (wind)	2400 Pa*
Downforce load (snow)	5400 Pa*
Hail Resistance	Max. diameter 25mm, impact speed 23m/s

*For more information please refer to Instruction Manual

MODULE TYPE	MB7-44SCF 400 Wp		405 Wp		410 Wp		415 Wp		420 Wp		425 Wp	
	STC	NMOT	STC	NMOT	STC	NMOT	STC	NMOT	STC	NMOT	STC	NMOT
ELECTRICAL CHARACTERISTICS												
Maximum power (Pmax / Wp)	400	301	405	305	410	309	415	312	420	316	425	320
Open circuit voltage (Voc / V)	41.2	39.3	41.3	39.4	41.4	39.5	41.5	39.6	41.6	39.7	41.7	39.8
Short circuit current (Isc / A)	12.41	10.00	12.53	10.09	12.65	10.19	12.80	10.31	12.92	10.41	13.03	10.50
Maximum power voltage (Vmp / V)	34.2	32.6	34.3	32.7	34.4	32.8	34.4	32.8	34.5	32.9	34.6	33.0
Maximum power current (Imp / A)	11.71	9.24	11.82	9.33	11.93	9.41	12.08	9.53	12.19	9.62	12.30	9.70
Module efficiency at STC (ηm / %)	20.1		20.4		20.6		20.9		21.1		21.4	
Power tolerance (Pmax)	(0,+5) Wp											

STC: Irradiance of 1000 W/m² with spectrum AM 1.5 and a module temperature of 25°C
 NMOT: Irradiance 800 W/m², ambient temperature 20°C and wind speed 1 m/s

I-V Curves



30 YEARS
Performance Guarantee

25 YEARS
Product Warranty

ASTORIOS

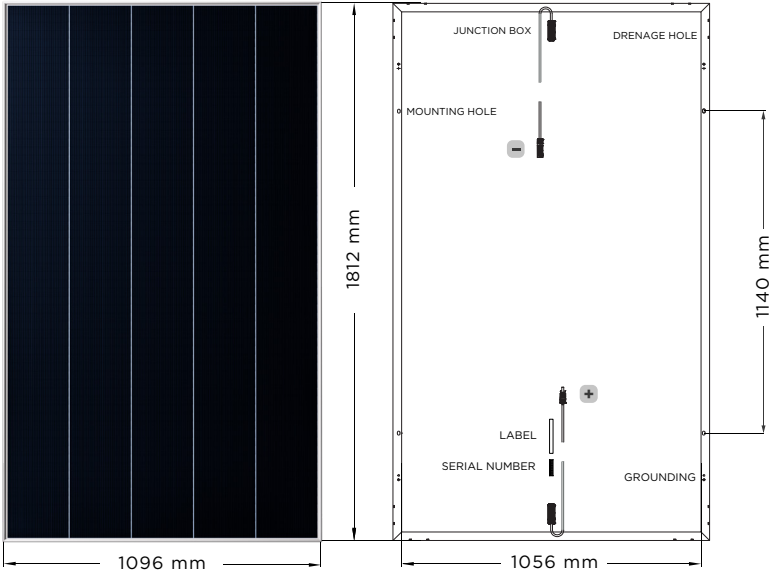
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PHOTOVOLTAIC MODULE

ASTR MB7-44SC Series
400-430 Wp

SHINGLED PERC CELLS

21.7 %
MAXIMUM MODULE EFFICIENCY



MATERIAL CHARACTERISTICS

Dimensions	1812x1096x30 mm (1.986 m ²)
Weight	20.8 kg
Glass	3.2 mm AR coated tempered glass, low iron
Cells	Mono-crystalline, PERC Shingled
Cell layout	305 pcs (61x5)
Frame	Silver color, Anodized aluminum alloy
Junction box	IP 68 rated, 2 bypass diodes
Output cable	4 mm ² , +300 mm/-1000 mm (Vertical), +220 mm/-180 mm (Horizontal)
Connector	Staubli MC4 (Original)

PACKAGING INFORMATION

One pallet quantity	36 pcs
40 ft HC/HQ container	924 pcs

TEMPERATURE PARAMETERS

Temperature Coefficient of Pmax	-0.34 % / °C
Temperature Coefficient of Voc	-0.27 % / °C
Temperature Coefficient of Isc	+0.04 % / °C
Operating Temperature	-40°C to +85 °C
Nominal Module Operating Temperature (NMOT)	42.3±2°C

MAXIMUM RATINGS

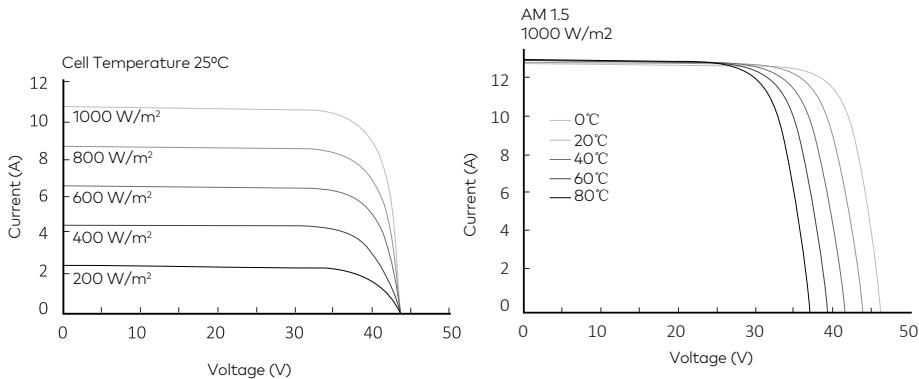
Max. System Voltage	1500V DC (IEC)
Max. Series Fuse Rating	25A
Uplift load (wind)	2400 Pa*
Downforce load (snow)	5400 Pa*
Hail Resistance	Max. diameter 25mm, impact speed 23m/s

*For more information please refer to Instruction Manual

MODULE TYPE	MB7-44SC	400 Wp	405 Wp	410 Wp	415 Wp	420 Wp	425 Wp	430 Wp
ELECTRICAL CHARACTERISTICS	STC	NMOT	STC	NMOT	STC	NMOT	STC	NMOT
Maximum power (Pmax / Wp)	400	301	405	305	410	309	415	312
Open circuit voltage (Voc / V)	41.2	39.3	41.3	39.4	41.4	39.5	41.5	39.6
Short circuit current (Isc / A)	12.41	10.00	12.53	10.09	12.65	10.19	12.80	10.31
Maximum power voltage (Vmp / V)	34.2	32.6	34.3	32.7	34.4	32.8	34.4	32.8
Maximum power current (Imp / A)	11.71	9.24	11.82	9.33	11.93	9.41	12.08	9.53
Module efficiency at STC (ηm / %)	20.1		20.4		20.6		20.9	21.1
Power tolerance (Pmax)							(0,+5) Wp	

STC: Irradiance of 1000 W/m² with spectrum AM 1.5 and a module temperature of 25°C
NMOT: Irradiance 800 W/m², ambient temperature 20°C and wind speed 1 m/s

I-V Curves



30 YEARS
Performance Guarantee

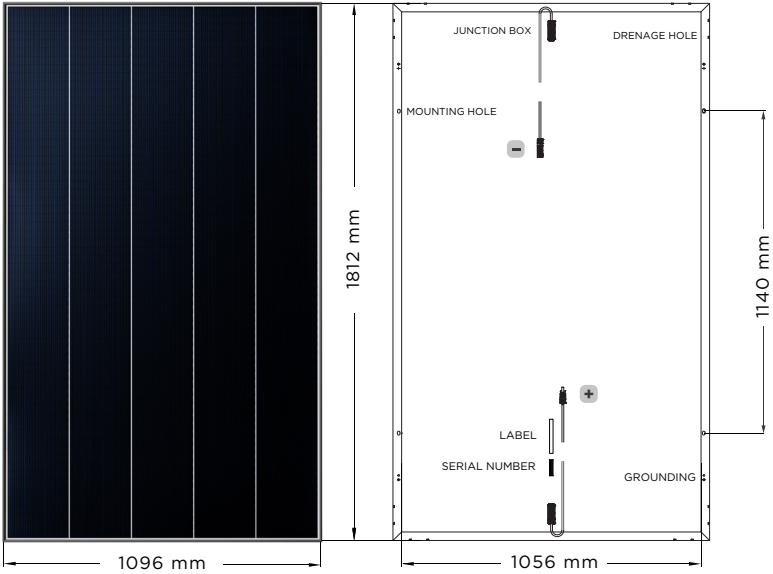
25 YEARS
Product Warranty

BLACK FRAME PHOTOVOLTAIC MODULE

ASTR MB7-44SCS Series
400-430 Wp

SHINGLED PERC CELLS

21.7 %
MAXIMUM MODULE EFFICIENCY



MATERIAL CHARACTERISTICS

Dimensions	1812x1096x30 mm (1.986 m ²)
Weight	20.8 kg
Glass	3.2 mm AR coated tempered glass, low iron
Cells	Mono-crystalline, PERC Shingled
Cell layout	305 pcs (61x5)
Frame	Black color, Anodized aluminum alloy
Junction box	IP 68 rated, 2 bypass diodes
Output cable	4 mm ² , +300 mm/-1000 mm (Vertical), +220 mm/-180 mm (Horizontal)
Connector	Staubli MC4 (Original)

PACKAGING INFORMATION

One pallet quantity	36 pcs
40 ft HC/HQ container	924 pcs

TEMPERATURE PARAMETERS

Temperature Coefficient of Pmax	-0.34 % / °C
Temperature Coefficient of Voc	-0.27 % / °C
Temperature Coefficient of Isc	+0.04 % / °C
Operating Temperature	-40°C to +85 °C
Nominal Module Operating Temperature (NMOT)	42.3±2°C

MAXIMUM RATINGS

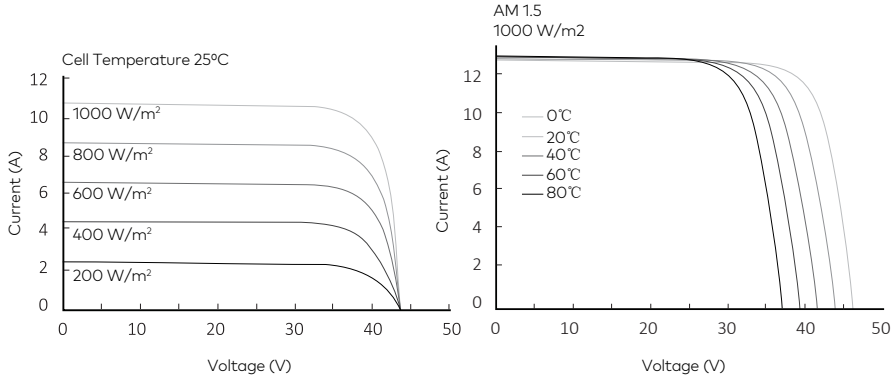
Max. System Voltage	1500V DC (IEC)
Max. Series Fuse Rating	25A
Uplift load (wind)	2400 Pa*
Downforce load (snow)	5400 Pa*
Hail Resistance	Max. diameter 25mm, impact speed 23m/s

*For more information please refer to Instruction Manual

MODULE TYPE	MB7-44SCS 400 Wp		405 Wp		410 Wp		415 Wp		420 Wp		425 Wp		430 Wp	
ELECTRICAL CHARACTERISTICS	STC	NMOT	STC	NMOT	STC	NMOT	STC	NMOT	STC	NMOT	STC	NMOT	STC	NMOT
Maximum power (Pmax / Wp)	400	301	405	305	410	309	415	312	420	316	425	320	430	324
Open circuit voltage (Voc / V)	41.2	39.3	41.3	39.4	41.4	39.5	41.5	39.6	41.6	39.7	41.7	39.8	41.8	39.8
Short circuit current (Isc / A)	12.41	10.00	12.53	10.09	12.65	10.19	12.80	10.31	12.92	10.41	13.03	10.50	13.05	10.51
Maximum power voltage (Vmp / V)	34.2	32.6	34.3	32.7	34.4	32.8	34.4	32.8	34.5	32.9	34.6	33.0	34.7	33.1
Maximum power current (Imp / A)	11.71	9.24	11.82	9.33	11.93	9.41	12.08	9.53	12.19	9.62	12.30	9.70	12.40	9.79
Module efficiency at STC (ηm / %)	20.1		20.4		20.6		20.9		21.1		21.4		21.7	
Power tolerance (Pmax)	(0,+5) Wp													

STC: Irradiance of 1000 W/m² with spectrum AM 1.5 and a module temperature of 25°C
 NMOT: Irradiance 800 W/m², ambient temperature 20°C and wind speed 1 m/s

I-V Curves



30 YEARS
Performance Guarantee

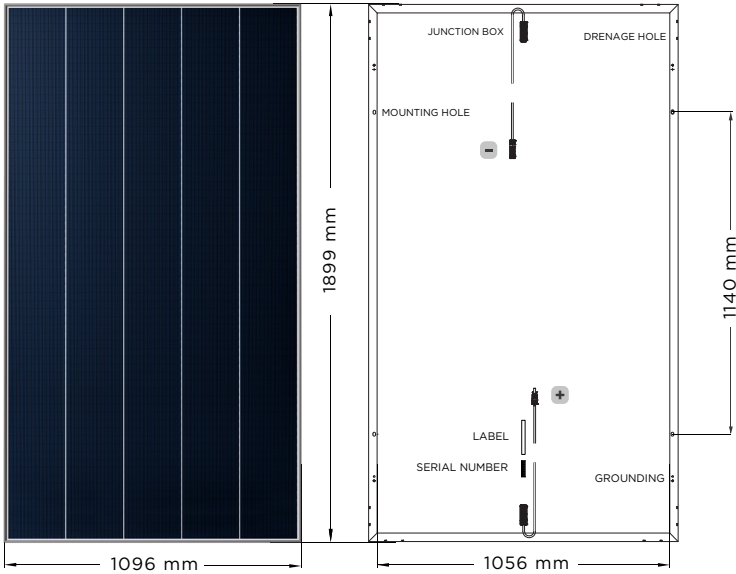
25 YEARS
Product Warranty

PHOTOVOLTAIC MODULE

ASTR MB7-46SC Series
420-445 Wp

SHINGLED PERC CELLS

21.4 %
MAXIMUM MODULE EFFICIENCY



MATERIAL CHARACTERISTICS

Dimensions	1899 x 1096 x 30 mm
Weight	21.8 kg
Glass	3.2 mm AR coated tempered glass, low iron
Cells	Mono-crystalline, PERC Shingled
Cell layout	320 pcs (64x5)
Frame	Silver color, Anodized aluminum alloy
Junction box	IP 68 rated, 2 bypass diodes
Output cable	4 mm ² , +300 mm/-1000 mm (Vertical), +250 mm/-150 mm (Horizontal)
Connector	Staubli MC4 (Original)

PACKAGING INFORMATION

One pallet quantity	36 pcs
40 ft HC/HQ container	864 pcs

TEMPERATURE PARAMETERS

Temperature Coefficient of Pmax	-0.34 % / °C
Temperature Coefficient of Voc	-0.27 % / °C
Temperature Coefficient of Isc	+0.04 % / °C
Operating Temperature	-40°C to +85 °C
Nominal Module Operating Temperature (NMOT)	42.3±2°C

MAXIMUM RATINGS

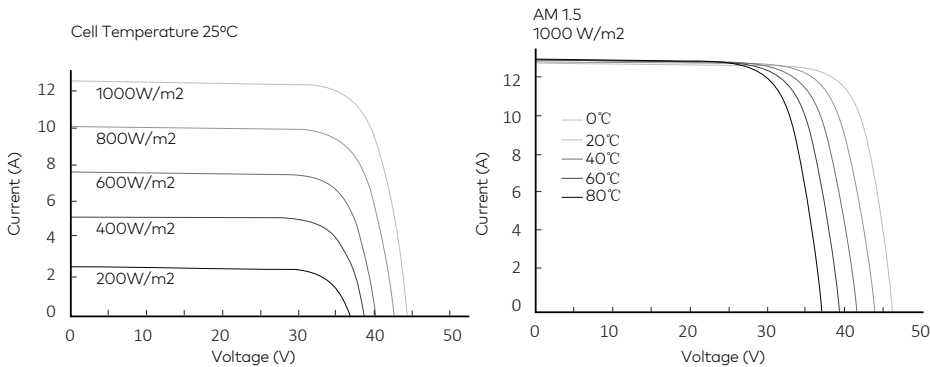
Max. System Voltage	1000/1500V DC (IEC)
Max. Series Fuse Rating	25A
Uplift load (wind)	2400 Pa*
Downforce load (snow)	5400 Pa*
Hail Resistance	Max. diameter 25 mm, impact speed 23 m/s

*For more information please refer to Instruction Manual

MODULE TYPE	MB7-46SC 420 Wp		425 Wp		430 Wp		435 Wp		440 Wp		445 Wp	
ELECTRICAL CHARACTERISTICS	STC	NMOT	STC	NMOT	STC	NMOT	STC	NMOT	STC	NMOT	STC	NMOT
Maximum power (Pmax / Wp)	420	316	425	320	430	324	435	328	440	331	445	335
Open circuit voltage (Voc / V)	43.3	41.3	43.4	41.4	43.5	41.5	43.6	41.6	43.7	41.7	43.8	41.8
Short circuit current (Isc / A)	12.46	10.05	12.56	10.14	12.68	10.23	12.79	10.32	12.90	10.41	13.01	10.50
Maximum power voltage (Vmp / V)	35.9	34.2	36.0	34.3	36.1	34.4	36.2	34.5	36.3	34.6	36.4	34.7
Maximum power current (Imp / A)	11.71	9.24	11.81	9.32	11.92	9.41	12.02	9.49	12.13	9.57	12.23	9.66
Module efficiency at STC (ηm / %)	20.2		20.4		20.7		20.9		21.1		21.4	
Power tolerance (Pmax)	(0,+5) Wp											

STC: Irradiance of 1000 W/m² with spectrum AM 1.5 and a module temperature of 25°C
NMOT: Irradiance 800 W/m², ambient temperature 20°C and wind speed 1 m/s

I-V Curves



30 YEARS
Performance Guarantee

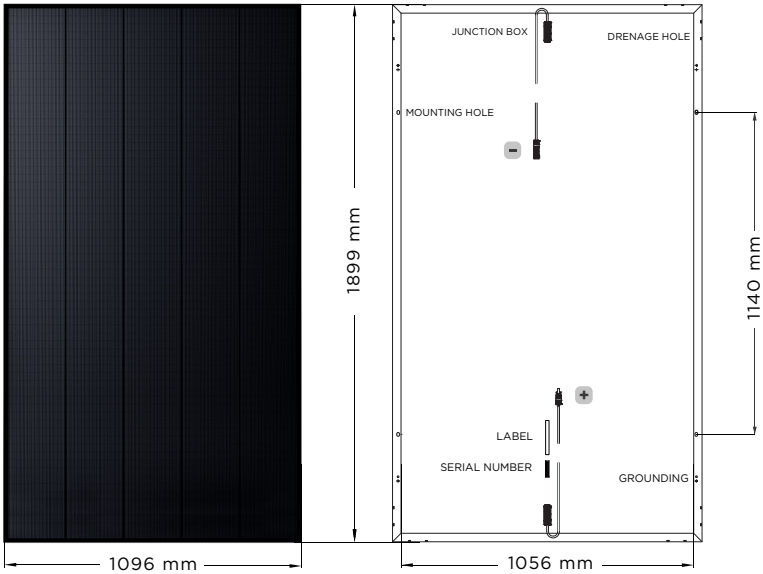
25 YEARS
Product Warranty

ULTRA BLACK PHOTOVOLTAIC MODULE

ASTR MB7-46SCF Series
420-445 Wp

SHINGLED PERC CELLS

21.4 %
MAXIMUM MODULE EFFICIENCY



MATERIAL CHARACTERISTICS

Dimensions	1899 x 1096 x 30 mm
Weight	21.8 kg
Glass	3.2 mm AR coated tempered glass, low iron
Cells	Mono-crystalline, PERC Shingled
Cell layout	320 pcs (64x5)
Frame	Black color, Anodized aluminum alloy
Junction box	IP 68 rated, 2 bypass diodes
Output cable	4 mm ² , +300 mm/-1000 mm (Vertical), +250 mm/-150 mm (Horizontal)
Connector	Staubli MC4 (Original)

PACKAGING INFORMATION

One pallet quantity	36 pcs
40 ft HC/HQ container	864 pcs

TEMPERATURE PARAMETERS

Temperature Coefficient of Pmax	-0.34 % / °C
Temperature Coefficient of Voc	-0.27 % / °C
Temperature Coefficient of Isc	+0.04 % / °C
Operating Temperature	-40°C to +85 °C
Nominal Module Operating Temperature (NMOT)	42.3±2°C

MAXIMUM RATINGS

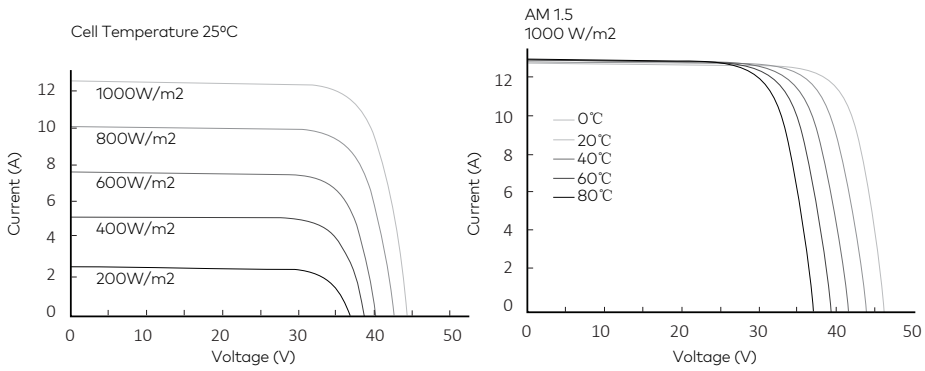
Max. System Voltage	1000/1500V DC (IEC)
Max. Series Fuse Rating	25A
Uplift load (wind)	2400 Pa*
Downforce load (snow)	5400 Pa*
Hail Resistance	Max. diameter 25 mm, impact speed 23 m/s

*For more information please refer to Instruction Manual

MODULE TYPE	MB7-46SCF 420 Wp		425 Wp		430 Wp		435 Wp		440 Wp		445 Wp	
ELECTRICAL CHARACTERISTICS	STC	NMOT	STC	NMOT	STC	NMOT	STC	NMOT	STC	NMOT	STC	NMOT
Maximum power (Pmax / Wp)	420	316	425	320	430	324	435	328	440	331	445	335
Open circuit voltage (Voc / V)	43.3	41.3	43.4	41.4	43.5	41.5	43.6	41.6	43.7	41.7	43.8	41.8
Short circuit current (Isc / A)	12.46	10.05	12.56	10.14	12.68	10.23	12.79	10.32	12.90	10.41	13.01	10.50
Maximum power voltage (Vmp / V)	35.9	34.2	36.0	34.3	36.1	34.4	36.2	34.5	36.3	34.6	36.4	34.7
Maximum power current (Imp / A)	11.71	9.24	11.81	9.32	11.92	9.41	12.02	9.49	12.13	9.57	12.23	9.66
Module efficiency at STC (ηm / %)	20.2		20.4		20.7		20.9		21.1		21.4	
Power tolerance (Pmax)	(0,+5) Wp											

STC: Irradiance of 1000 W/m² with spectrum AM 1.5 and a module temperature of 25°C
NMOT: Irradiance 800 W/m², ambient temperature 20°C and wind speed 1 m/s

I-V Curves



30 YEARS
Performance Guarantee

25 YEARS
Product Warranty

HALF CUT PV MODULES (P-Type, PERC)

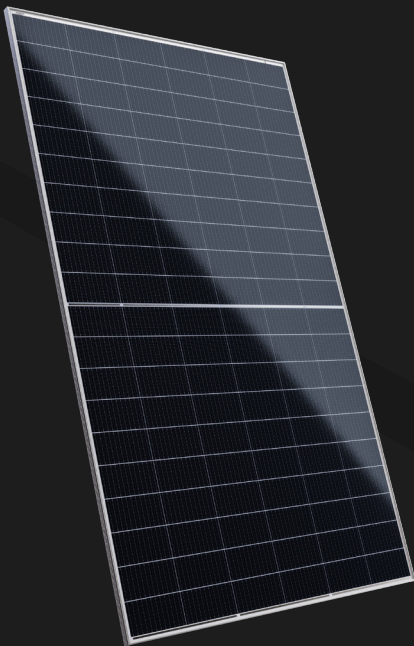
Passivated Emitter Rear Contact (PERC) Half Cut technology is a time-tested and widely-used standard in solar panel manufacturing worldwide.

Nowadays, modules manufactured with this technology are more affordable and mainly used for a large industrial energy generation systems installation, where there are no strict size limitations.

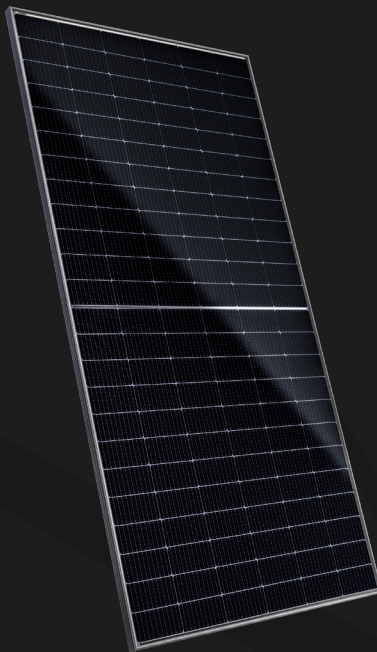
Multi-busbar technology is used in these modules for greater light absorption and high electrical conductivity, resulting in more efficient output. These PV modules are less affected by partial shading due to separation of the module's connections into two halves. When one half of the module is shaded, the other is unaffected by shade.

Advanced cutting, soldering, and sorting technologies for PV cells minimize the risk of hot-spots and ensure proper module temperature control. Each solar panel undergo current sorting to prevent mismatch in energy generation and subsequent degradation. Proper sorting results in higher energy output. Easy maintenance and higher energy output achieved through the easy-to-clean glass surfaces with high transparency.

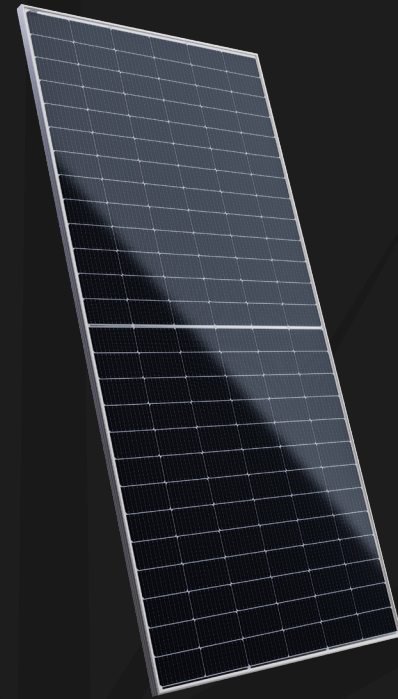
Usage of high-quality components, including sealants, and rigorous quality control in every step of production ensure PID resistance (Potential Induced Degradation) throughout the module's lifetime.



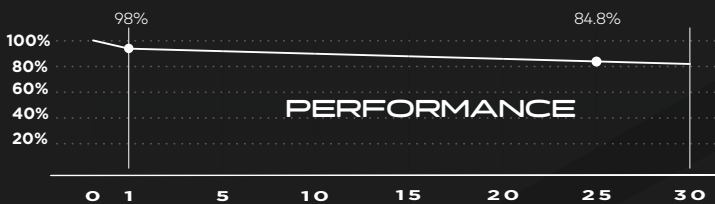
ASTR 120HC/12 Series
585-605 Wp



ASTR 144HC/10 Series
530-550 Wp



ASTR 156HC/10 Series
565-585 Wp

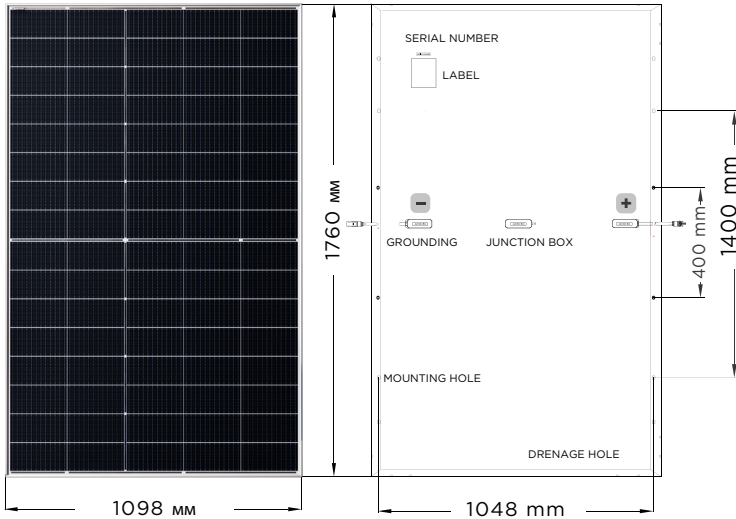


PHOTOVOLTAIC MODULE

ASTR 80HC/12 Series
385-405 Wp

HALF CUT PERC CELLS

21.0%
MAXIMUM MODULE EFFICIENCY



MATERIAL CHARACTERISTICS

Dimensions	1760 x 1098 x 35 mm
Weight	21.5 kg
Number of cells	80 pcs (5x16)
Cells Type	Mono-crystalline, Half Cut PERC 10BB (210 mm)
Glass	3.2 mm AR coated tempered glass, low iron
Frame	Silver color, Anodized aluminum alloy
Junction box	IP68, 3 diodes
Connector type	Staubli MC4 (Original)
Cable	4 mm ² , 300 mm

PACKAGING INFORMATION

One pallet quantity	31 pcs
40 ft HC/HQ container	806 pcs

TEMPERATURE PARAMETERS

Temperature Coefficient of Pmax	-0.34 % / °C
Temperature Coefficient of Voc	-0.25 % / °C
Temperature Coefficient of I _c	+0.04 % / °C
Operating Temperature	-40°C to +85 °C
Normal Operating Cell Temperature (NOCT)	43±2°C

MAXIMUM RATINGS

Max. System Voltage	1500V DC -(H)
Max. Series Fuse Rating	25A
Uplift load (wind)	2400 Pa*
Downforce load (snow)	5400 Pa*

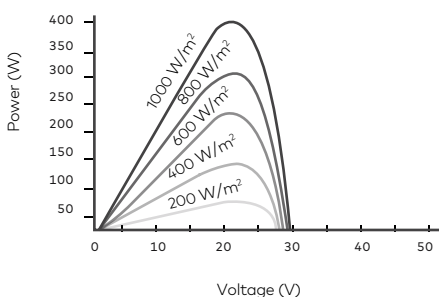
*For more information please refer to Instruction Manual

MODULE TYPE	80HC/12		385 Wp		390 Wp		395 Wp		400 Wp		405 Wp	
	STC	NMOT	STC	NMOT	STC	NMOT	STC	NMOT	STC	NMOT	STC	NMOT
ELECTRICAL CHARACTERISTICS												
Maximum power (P _{max} / Wp)	385	291	390	295	395	299	400	302	405	306		
Open circuit voltage (V _{oc} / V)	28.6	27.0	28.9	27.2	29.1	27.5	29.4	27.7	29.6	27.9		
Short circuit current (I _{sc} / A)	17.19	13.85	17.26	13.91	17.33	13.96	17.40	14.02	17.47	14.07		
Maximum power voltage (V _{mp} / V)	23.7	22.1	24.0	22.3	24.2	22.5	24.4	22.7	24.6	22.9		
Maximum power current (I _{mp} / A)	16.19	13.16	16.26	13.22	16.32	13.27	16.39	13.33	16.45	13.37		
Module efficiency at STC (η _m / %)	20.0		20.2		20.5		20.7		21.0			
Power tolerance (P _{max})	(0,+5) Wp											

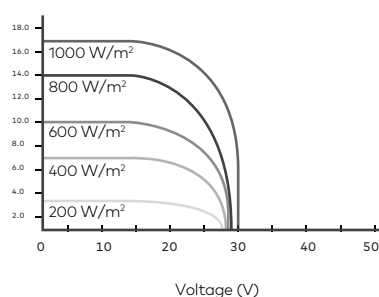
STC: Irradiance of 1000 W/m² with spectrum AM 1.5 and a module temperature of 25°C

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

P-V Curve at Different Irradiation (395 W)
Cell Temperature 25°C



I-V Curve (395 W)
Cell Temperature 25°C



30 YEARS
Performance Guarantee

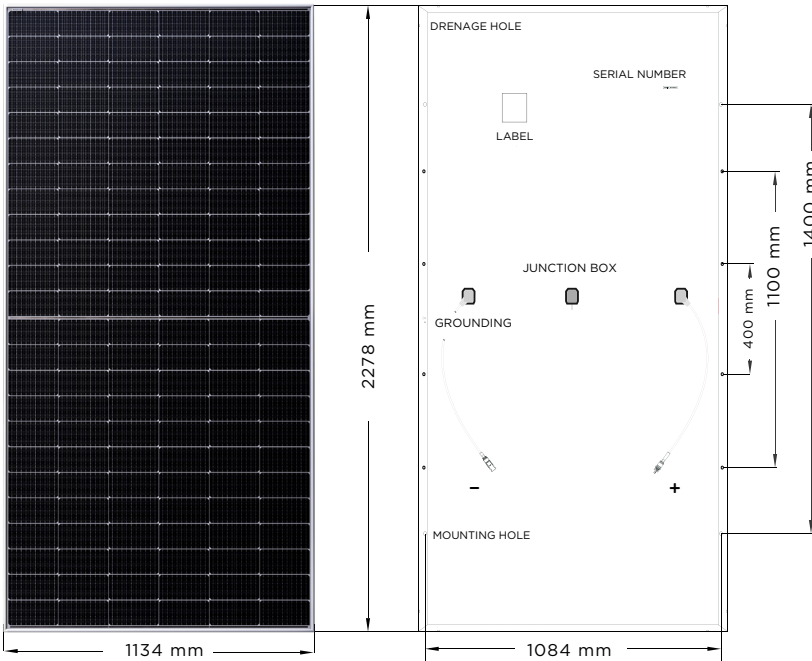
15 YEARS
Product Warranty

PHOTOVOLTAIC MODULE

ASTR 144HC/10 Series
530-555 Wp

HALF CUT PERC CELLS

21.6%
MAXIMUM MODULE EFFICIENCY



MATERIAL CHARACTERISTICS

Dimensions	2278 x 1134 x 35 mm
Weight	29.0 kg
Number Of Cells	144 pcs (6x24)
Cells	Mono-crystalline, Half Cut PERC 10BB (182mm)
Glass	3.2 mm, High transparency, AR coated
Frame	Silver color, Anodized aluminum alloy
Junction box	IP68 Rated, 3 bypass diodes
Connector type	Staubli MC4-Evo 2 / MC4 (Original)
Cable	4 mm ² , 300 mm

TEMPERATURE PARAMETERS

Temperature Coefficient of Pmax	-0.35 % / °C
Temperature Coefficient of Voc	-0.27% / °C
Temperature Coefficient of Isc	+0.048 % / °C
Operating Temperature	-40°C to +85°C
Normal Operating Cell Temperature (NOCT)	44±2°C

MAXIMUM RATINGS

Max. System Voltage	1500V DC -(H)
Max. Series Fuse Rating	25 A
Uplift load (wind)	2400 Pa*
Downforce load (snow)	5400 Pa*

PACKAGING INFORMATION

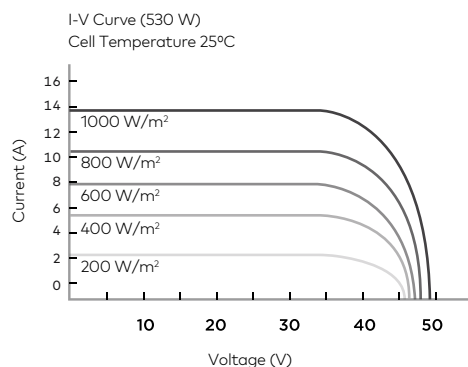
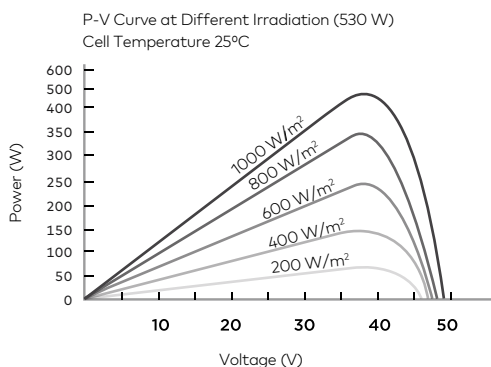
	31 pcs
One pallet quantity	620 pcs
40 ft HC/HQ container	

*For more information please refer to Instruction Manual

MODULE TYPE	144HC/10		530 Wp		535 Wp		540 Wp		545 Wp		550 Wp		555 Wp	
	STC	NMOT	STC	NMOT	STC	NMOT	STC	NMOT	STC	NMOT	STC	NMOT	STC	NMOT
ELECTRICAL CHARACTERISTICS														
Maximum power (Pmax / Wp)	530	394	535	398	540	402	545	406	550	410	555	414		
Open circuit voltage (Voc / V)	49.26	46.50	49.34	46.63	49.42	46.75	49.50	46.88	49.62	47.00	49.72	47.12		
Short circuit current (Isc / A)	13.71	11.06	13.79	11.12	13.85	11.19	13.94	11.25	14.03	11.32	14.10	11.32		
Maximum power voltage (Vmp / V)	40.56	37.92	40.63	38.05	40.70	38.19	40.80	38.32	40.90	38.46	41.00	38.62		
Maximum power current (Imp / A)	13.07	10.40	13.17	10.46	13.27	10.52	13.36	10.58	13.45	10.64	13.54	10.72		
Module efficiency at STC (ηm / %)	20.7		20.9		21.1		21.3		21.5		21.6			
Power tolerance (Pmax)	(0,+5) Wp													

STC: Irradiance of 1000 W/m² with spectrum AM 1.5 and a module temperature of 25°C

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



30 YEARS
Performance Guarantee

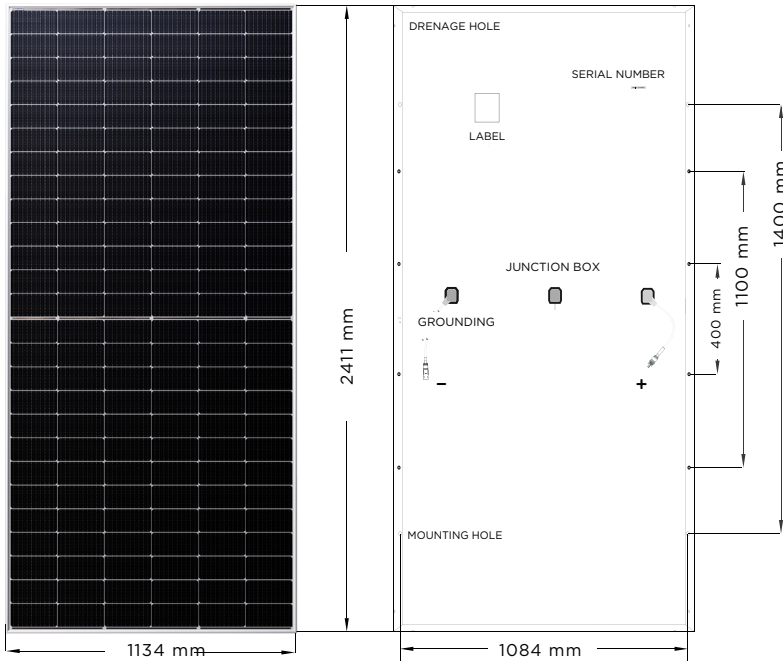
15 YEARS
Product Warranty

PHOTOVOLTAIC MODULE

ASTR 156HC/10 Series
565-585 Wp

HALF CUT PERC CELLS

21.4%
MAXIMUM MODULE EFFICIENCY



MATERIAL CHARACTERISTICS

Dimensions	2411 x 1134 x 35 mm
Weight	30.6 kg
Number of cells	156 pcs (6x26)
Cells	Mono-crystalline, Half Cut PERC 10BB (182 mm)
Glass	3.2 mm, High transparency, AR coated
Frame	Silver color, Anodized aluminum alloy
Junction box	IP68 Rated, 3 bypass diodes
Connector type	Staubli MC4 (Original)
Cable	4 mm ² , 300 mm

PACKAGING INFORMATION

One pallet quantity	31 pcs
40 ft HC/HQ container	620 pcs

TEMPERATURE PARAMETERS

Temperature Coefficient of Pmax	-0.35 % / °C
Temperature Coefficient of Voc	-0.27 % / °C
Temperature Coefficient of Isc	+0.048 % / °C
Operating Temperature	-40°C to +85 °C
Normal Operating Cell Temperature (NOCT)	44±2°C

MAXIMUM RATINGS

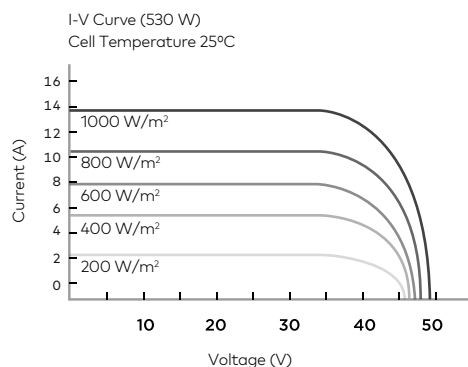
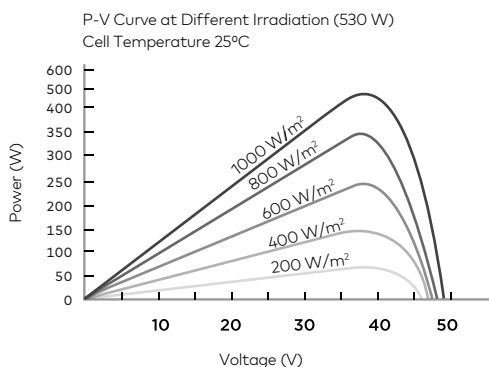
Max. System Voltage	1500V DC -(H)
Max. Series Fuse Rating	25 A
Uplift load (wind)	2400 Pa*
Downforce load (snow)	5400 Pa*

*For more information please refer to Instruction Manual

MODULE TYPE	156HC/10		565 Wp		570 Wp		575 Wp		580 Wp		585 Wp	
	STC	NMOT	STC	NMOT	STC	NMOT	STC	NMOT	STC	NMOT	STC	NMOT
ELECTRICAL CHARACTERISTICS												
Maximum power (Pmax / Wp)	565	420	570	424	575	428	580	432	585	435		
Open circuit voltage (Voc / V)	53.53	50.53	53.61	50.60	53.70	50.69	53.81	50.79	53.92	50.89		
Short circuit current (Isc / A)	13.48	10.89	13.55	10.94	13.62	11.00	13.70	11.07	13.78	11.13		
Maximum power voltage (Vmp / V)	44.08	41.05	44.19	41.17	44.30	41.29	44.41	41.41	44.52	41.53		
Maximum power current (Imp / A)	12.82	10.24	12.90	10.30	12.98	10.36	13.06	10.42	13.14	10.48		
Module efficiency at STC (ηm / %)	20.6		20.8		21.0		21.2		21.4			
Power tolerance (Pmax)	(0,+5) Wp											

STC: Irradiance of 1000 W/m² with spectrum AM 1.5 and a module temperature of 25°C

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



30 YEARS
Performance Guarantee

15 YEARS
Product Warranty

COMMERCIAL AND INDUSTRIAL BATTERY ENERGY STORAGE SYSTEMS

At ASTORIOS, we provide advanced BESS for C&I projects. Our expertise extends to manufacturing innovative solutions, system integration, and supply chain excellence, ensuring full satisfaction to our customers.

Our customized, modular, cabinet, and containerized BESS products (from 40 kW to MW+) for C&I are perfectly suited to businesses in search of energy storage solutions that are both flexible and efficient. Systems are engineered for easy deployment and integration, making them a perfect choice for various applications – self-consumption, backup and emergency power supply, peak shaving and valley filling, demand reduction and fuel saving, frequency modulation, and grid quality adjustment. ASTORIOS Lithium Iron Phosphate BESS are equipped with advanced intelligent integrated systems including fire protection (detection and suppression), short circuit protection, liquid and air cooling, efficient space utilization, intrusion detection, communication, and monitoring interfaces. This integration not only enhances the safety of our energy storage solutions but also ensures they operate at peak efficiency, delivering unparalleled performance and reliability.

ASTORIOS recognizes the importance of intelligent energy management. That's why our BESS are seamlessly integrated with advanced Energy Management Systems (EMS). This integration allows for sophisticated and high-level complexity management of energy resources, ensuring optimal performance and efficiency.

ASTORIOS BESS solutions integrate the following components (optional):

- Human Machine Interface (HMI)
- Energy Management Systems (EMS)
- Backup power sources management system (diesel generators, UPS)
- Power Conversion System (PCS)
- Static Transfer Switch (STS)
- State of Charge (SoC) monitoring
- State of Health (SoH) monitoring
- Controller Area Network (CAN) and RS485 standards compatibility
- Remote management and control (SCADA, Modbus, Ethernet)
- Electrical data monitoring and cloud storage system
- Temperature monitoring system
- Firefighting system
- Overvoltage, reverse current, short circuit, and other electrical protection systems

Quality is at the heart of everything we do at ASTORIOS. Our BESS are a testament to our commitment to premium quality. Engineered to handle high-complexity applications, our systems ensure reliability and longevity, meeting the demanding needs of commercial energy storage.



CERTIFICATION

ASTORIOS production lines, processes, technologies, and products have been certified by leading companies in the industry. The production lines and manufacturing processes have been certified according to management and safety requirements, while the technologies have been evaluated to meet the industry's standards. Products have undergone numerous tests, trials, and modifications to meet the highest standards of quality, reliability, safety, and long-term performance in extreme weather and harsh conditions.

Certification involves periodic inspections by certifying companies of the manufacturing and products, testing and examination for any changes in technology or components, calibration of testing stations, and rigorous quality assurance checks using automated equipment specified in certification standards.

Manufacturing raw materials and component suppliers as well meet international quality standards. All our suppliers are certified to insure the top tier level of production. Components and raw materials are required to pass strict test control before being used in production.

PV MODULES

The multi-stage quality control system in the manufacturing process includes inspection of the raw materials and components, soldering, electro-luminescent (EL) and optical testing using micro-shot cameras in the test station to detect any defects or damage. After the lamination and assembly of frames and connectors, the modules undergo visual inspection, followed by testing on the second test station and on the station for determining electrical characteristics. Only solar panels that pass the quality control at all stages and sorting at the final stage can be shipped to customers.

UL 61730 Requirements for photovoltaic module design and safety standards in the United States
IEC61215/61730 Requirements for module design and safety evaluation
IEC62804 PID resistance
IEC61701 Salt resistance
IEC62716 Ammonia resistance
IEC60068-2-68 Sand and Dust Resistance
IC TS 62941-2016 PV Industry quality management system
ISO 9001:2015 Quality Management standards
ISO 14001:2015 Environmental Management System
ISO 45001:2018 Occupational Health and Safety Management System
ISO 50001:2011 Energy management standards
CE Declaration of conformity to European Union standards

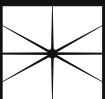
BATTERY ENERGY STORAGE SYSTEMS

ASTORIOS uses Lithium iron phosphate (LIFEPO4, LFP) batteries to ensure that our customers benefit from premium characteristics while upholding the highest safety standards. To guarantee long mechanical lifespans and durability, we use only reliable casing materials. ASTORIOS's products are certified by all necessary international standards for production, quality, safety, management, packaging, and operation.

IIEC62119-2017 Requirements for the safe operation of lithium cells and batteries
IEC62477 Safety Requirements for PECS (Power electric converter systems)
SPS-C KBIA-10104-03-7312 Safety test and performance test requirements
EN IEC 61000-6-1:2019 Electromagnetic compatibility (Immunity standard for residential, commercial and light-industrial environments)
EN IEC 61000-6-2:2019 Electromagnetic compatibility (Immunity standard for residential, commercial and light-industrial environments)
EN IEC 61000-6-3:2021 Electromagnetic compatibility (Emission standard for residential, commercial and light-industrial environments)
EN IEC 61000-6-4:2019 Electromagnetic compatibility (Emission standard for industrial environments)



ASTORIOS



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