POWER ELECTRONICS®
SAVING ENERGY FOR THINGS THAT MATTER

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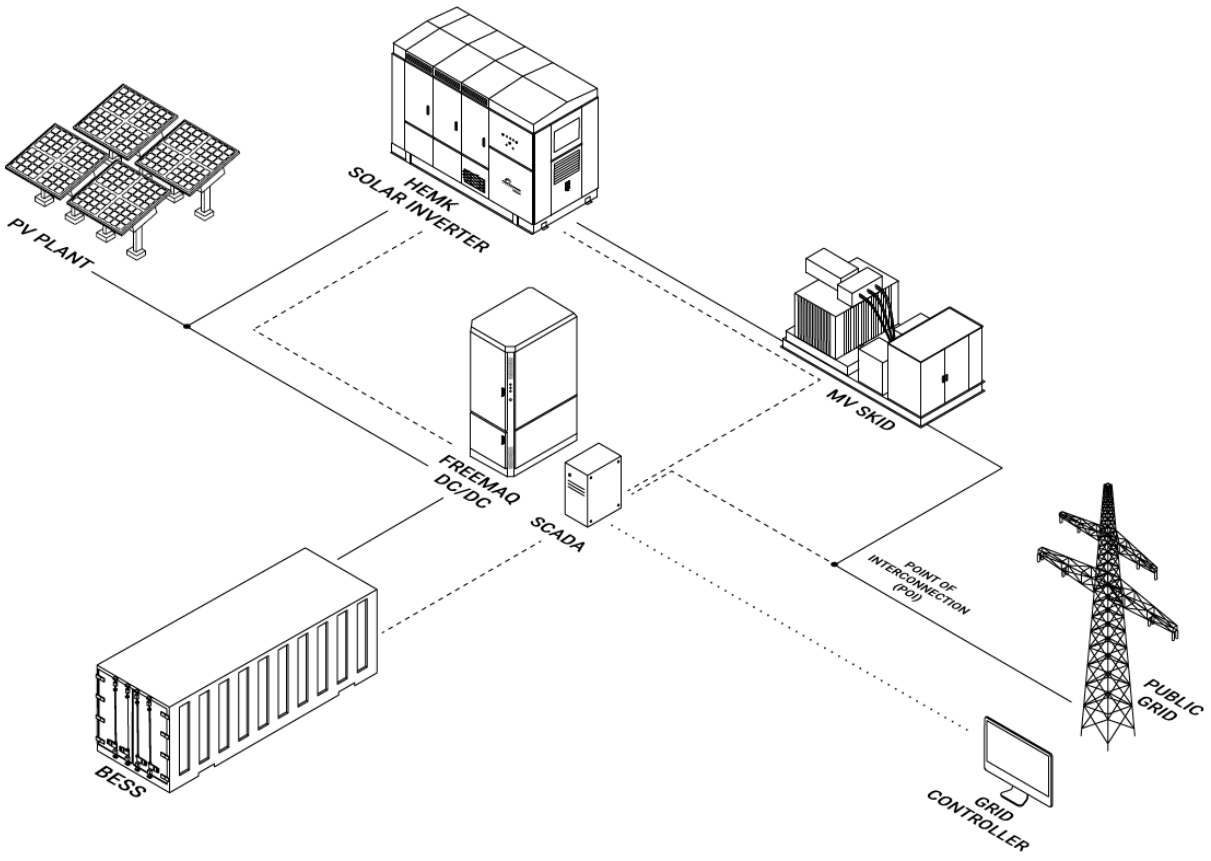
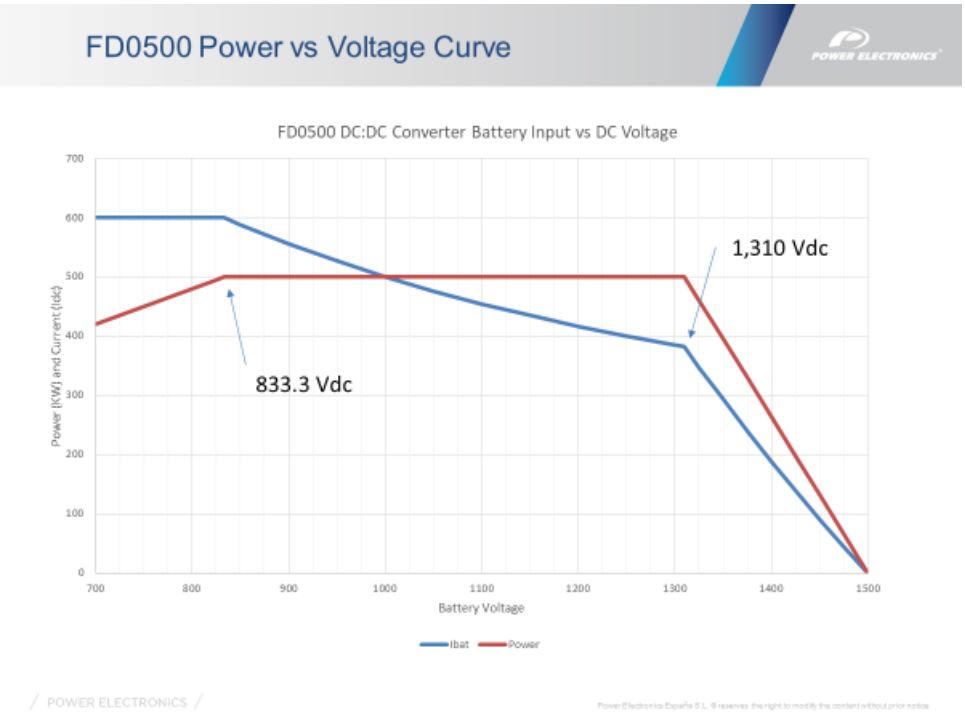
Power Electronics FD0500 DC:DC Converter for DC Coupled Solar and Energy Storage



Parameter	FS0500DC-1500 Bi-directional DC/DC Converter	Comments
DC Input Power Module		
Rated Power	500 KW	Per Converter
PV Voltage Range	800 Vdc to 1,310 Vdc (user Configurable)	Consult factory for different ranges
Battery Voltage Range	700 Vdc to 1,310 Vdc	
Maximum DC Input Voltage	1,500 Vdc	
DC Voltage Ripple	< 3%	
Maximum DC Output Current	600 Amps	
Battery Technology	compatible with all Battery Technologies and customer provided BMS system	
System Specifications		
Number of separate DC Inputs	1 DC input per Converter Module with up to 3 DC terminations pos/neg.	Consult factory for DC input options
Terminal Ratings	Up to 90 ℃	
Max Cable size	Up to 750 kcmil	
Cooling	Forced Air	
Frame size	FSDK Cabinet	
Dimensions (LxWxH)	1000 x 1200 x 1800 mm	
Max. Converter Efficiency (%)	98.5% at rated power	Preliminary
Standby Power Consumption	50 W	
Enclosure Rating	NEMA 3R /IP 54	NEMA 4 - Electronics cabinet
Color	RAL 7035	Consult factory for custom colors
Operating Temperature range	-20 ℃ to 50 ℃	-35 ℃ option with cold weather kit
Storage Temperature	-30 `℃ to 55 ℃	
Relative Humidity	4% to 95% noncondensing	
Max. Altitude	>4,000 M	Power derated 1% /200M above 2,000M
Audible Noise level	< 79 dBA	
Interfaces	Graphical Display (Freesun Caibinet), Emergency Pushbutton and indicator lights USB, RJ45 and RJ485 Interface	
Communications Protocol	MODbus TCP/IP, MODbus RTU,	
Plant Manager	Compatible with third party energy management systems	

Protections		
Ground Fault Detection	Insulation monitoring board	
System Protection	Heartbeat Signal Monitoring	TBD
DC disconnection & protection (PV)	Standard	
DC Disconnection	Optional	Future features
Certification		
Safety Certification	UL-1741 pending	

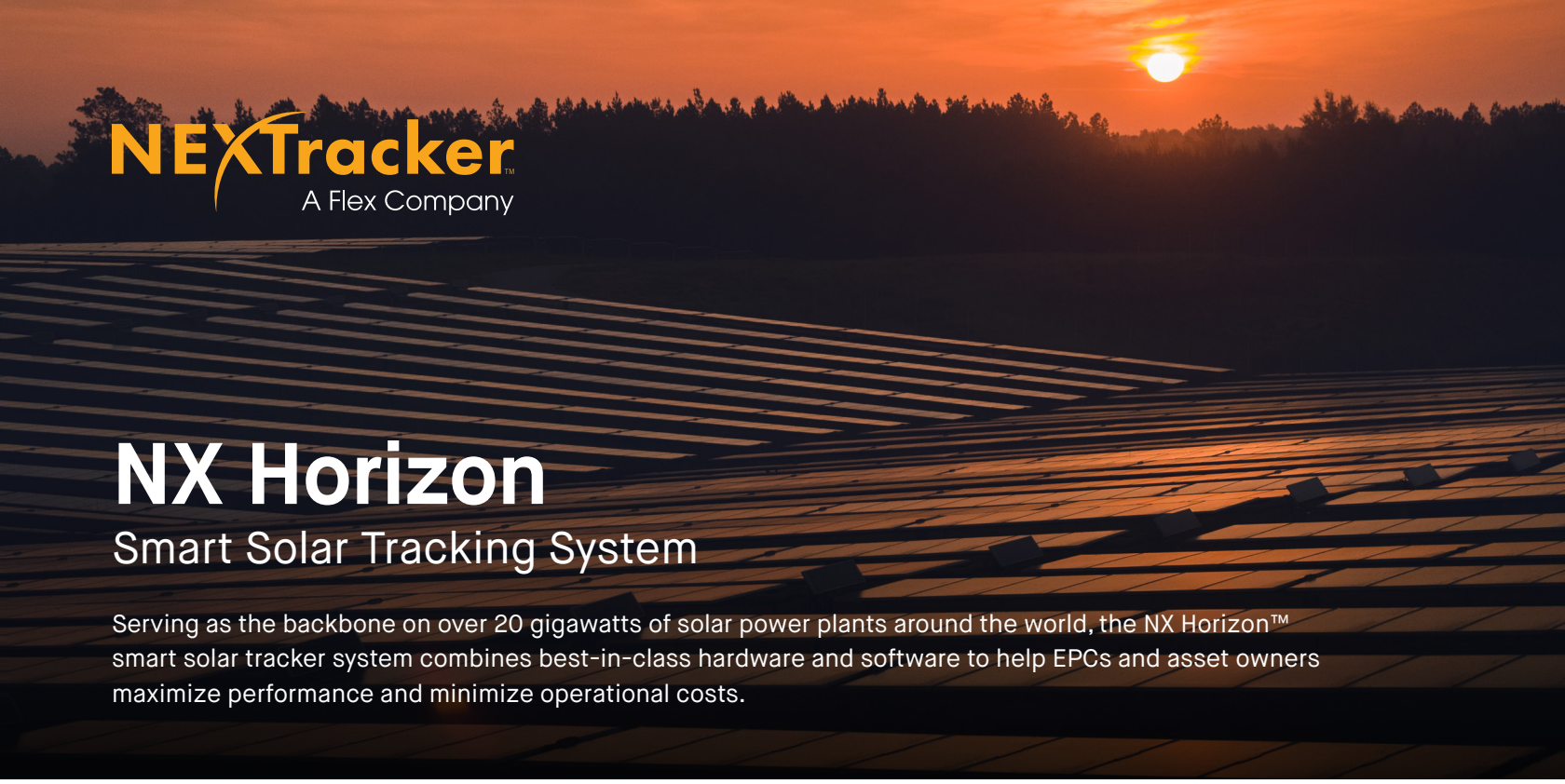


FD0500 Units can be paralleled for larger systems

TECHNICAL CHARACTERISTICS HEMK 600V

		FRAME 1	FRAME 2
REFERENCE		**FS2001K**	**FS3001K**
OUTPUT	AC Output Power(kVA/kW) @50°C [1]	2000/2000	3000/3000
	AC Output Power(kVA/kW) @25°C [1]	2200/2000	3300/3000
	Max. AC Output Current (A) @25°C	2120	3175
	Operating Grid Voltage(VAC) [2]	600V ±10%	
	Operating Grid Frequency(Hz)	50Hz/60Hz	
	Current Harmonic Distortion (THDi)	< 3% per IEEE519	
	Power Factor (cosine phi) [3]	0.5 leading … 0.5 lagging adjustable / Reactive Power injection at night	
INPUT	MPPt @full power (VDC)	849V-1310V	
	Maximum DC voltage	1500V	
	Number of inputs [2]	Up to 36	
	Number of MPPts	Up to 4	Up to 6
	Max. DC continuous current (A)	2645	3970
	Max. DC short circuit current (A)	4000	6000
EFFICIENCY & AUXILIARY SUPPLY	Max. Efficiency PAC, nom (η)	98.8%	98.8%
	Max. Power Consumption (KVA)	8	10
CABINET	Dimensions [WxDxH] (ft)	12 x 7 x 7	
	Dimensions [WxDxH] (m)	3.7 x 2.2 x 2.2	
	Weight (lb)	10802	15432
	Weight (kg)	4900	7000
	Type of ventilation	Forced air cooling	
ENVIRONMENT	Degree of protection	NEMA3R - IP54	
	Permissible Ambient Temperature	-35°C to +60°C / >50°C Active Power derating	
	Relative Humidity	4% to 100% non condensing	
	Max. Altitude (above sea level)	2000m; >2000m power derating (Max. 4000m)	
	Noise level [4]	< 79 dBA	
CONTROL INTERFACE	Interface	Graphic Display	
	Communication protocol	Modbus TCP	
	Plant Controller Communication	Optional	
	Keyed ON/OFF switch	Standard	
PROTECTIONS	Ground Fault Protection	GFDI and Isolation monitoring device	
	General AC Protection	Circuit Breaker	
	General DC Protection	Fuses	
	Overvoltage Protection	AC, DC Inverter and auxiliary supply type 2	
CERTIFICATIONS	Safety	UL1741, CSA 22.2 No.107.1-01, UL62109-1, IEC62109-1, IEC62109-2	
	Compliance	NEC 2014 / NEC 2017 (optional)	
	Utility interconnect	UL 1741SA-Sept.2016, IEEE 1547-2003	

[1] Values at 1.00•Vac nom and cos Φ= 1.
Consult Power Electronics for derating curves.
[2] Consult Power Electronics for other configurations.
[3] Consult P-Q charts available: Q(kVAr)=√(S(kVA)2-P(kW)2).
[4] Readings taken 1 meter from the back of the unit.



NEXTracker
A Flex Company

NX Horizon

Smart Solar Tracking System

Serving as the backbone on over 20 gigawatts of solar power plants around the world, the NX Horizon™ smart solar tracker system combines best-in-class hardware and software to help EPCs and asset owners maximize performance and minimize operational costs.

Self-Powered System with Smart Performance Monitoring

NX Horizon's reliable self-powered motor and control system, balanced mechanical design and independent row architecture provide project design flexibility, while lowering operation and maintenance (O&M) costs. NX Horizon works in concert with the NX Data Hub platform, a utility-grade software that uses bidirectional communications to each and every tracker row in the power plant for continuous, real-time monitoring. In addition, NEXTracker's Digital O&M™ services provide real-time analytics and predictive maintenance to help manage operations and minimize O&M costs over the lifetime of the systems.

Flexible and Resilient by Design

With its self-aligning module rails and vibration-proof fasteners, NX Horizon can be easily and rapidly installed. The self-powered, decentralized architecture allows each row to be commissioned in advance of site power,and is designed to withstand high winds and other adverse weather conditions. On a recent 838 megawatt project in Villanueva, Mexico, these design features allowed for the project to go online nine months ahead of schedule.

TrueCapture and Bifacial Enabled

Incorporating the most promising innovations in utility scale solar, NX Horizon with TrueCapture™ smart control system can add additional energy production by up to six per cent. Further unlocking the advantages of independent-row architecture and the data collected from thousands of sensors across its built-in wireless network, the software continuously optimizes the tracking algorithm of each row in response to site terrain and changing weather conditions. NX Horizon can also be paired with bifacial PV module technology, which can provide even more energy harvest and performance. With bifacial technology, NX Horizon outperforms conventional tracking systems with over 1% more annual energy.

4 YEARS IN A ROW
Global Market Share Leader (2015-18)

20+ GW
Delivered on 5 Continents

BEST-IN-CLASS
Software Ecosystem and Global Services

UP TO 6%
Using TrueCapture Smart Control System

Quality and Reliability from Day One

Quality and reliability are designed and tested into every NX Horizon component and system across our supply chain and manufacturing operations. NEXTracker is the leader in dynamic wind analysis and safety stowing, delivering major benefits in uptime and long-term durability. NX Horizon is certified to UL 2703 and UL 3703 standards, underscoring NEXTracker's commitment to safety, reliability and quality.

GENERAL AND MECHANICAL

Tracking type	Horizontal single-axis, independent row
String voltage	1,500 V_{DC} or 1,000 V_{DC}
Typical row size	78 - 90 modules, depending on module string length
Drive type	Non-backdriving, high accuracy slew gear
Motor type	24V brushless DC motor
Array height	Rotation axis elevation 1.3 to 1.8 m / 4'3" to 5'10"
Ground coverage ratio (GCR)	Configurable. Typical range 28-50%
Modules supported	Mounting options available for virtually all utility-scale crystalline modules, First Solar Series 6 and First Solar Series 4.
Bifacial features	High-rise mounting rails, bearing + driveline gaps and round torque tube

Tracking range of motion	Options for ±60° or ±50°
Operating temperature range	Self powered: -30°C to 55°C (-22°F to 131°F) AC powered: -40°C to 55°C (-40°F to 131°F)
Module configuration	1 in portrait. 3 x 1,500V or 4 x 1,000V strings per standard tracker. Partial length trackers available.
Module attachment	Self-grounding, electric tool-actuated fasteners
Materials	Galvanized steel
Allowable wind speed	Configurable up to 200 kph (125 mph) 3-second gust.
Wind protection	Intelligent wind stowing with symmetric dampers for maximum array stability in all wind conditions.
Foundations	Standard W6 section foundation posts

ELECTRONICS AND CONTROLS

Solar tracking method	Astronomical algorithm with backtracking. TrueCapture™ upgrades available for terrain adaptive backtracking and diffuse tracking mode.
Control electronics	NX tracker controller with inbuilt inclinometer and backup battery.
Communications	Zigbee wireless communications to all tracker rows and weather stations via network control units (NCUs).
Nighttime stow	Yes
Power supply	Self powered: NX provided 30 or 60W Smart Panel AC powered: Customer-provided 120-240 V_{AC} circuit

INSTALLATION, OPERATIONS AND SERVICE

PE stamped structural calculations and drawings	Included
Onsite training and system commissioning	Included
Installation requirements	Simple assembly using swaged fasteners and bolted connections. No field cutting, drilling or welding.
Monitoring	NX Data Hub™ centralized data aggregation and monitoring
Module cleaning compatibility	Compatible with NX qualified cleaning systems.
Warranty	10-year structural, 5-year drive and control components
Codes and standards	UL 3703, UL 2703, IEC 62817

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GCL-M3/72DH

Bifacial Monocrystalline Module

375-410W

410W
Maximum Power Output

20.1%
Maximum Module Efficiency

0~+5W
Power Output Guarantee

DUPONT — Use the Tedlar® PVF film produced by DUPONT

PID — Selected encapsulating material and stringent production process control ensure the product is highly PID resistant and snail trails free

Sand blowing test, salt mist test and ammonia test passed to endure harsh environments

30 Years — Higher lifetime power yield: 0.6% annual power degradation 30 years power warranty

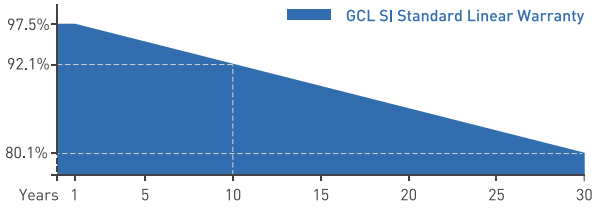
Special cell process ensures great performance under low irradiance conditions

Transparent backsheet, double-sided sun capturing, power generation increase in returns

GCL Delivers Reliable Performance Over Time

- World-class manufacturer of crystalline silicon photovoltaic modules
- Fully automatic facility and world-class technology
- Rigorous quality control to meet the highest standard: ISO 9001, ISO 14001 and ISO 45001
- Tested for harsh environments (salt mist, ammonia corrosion and sand blowing test: IEC 61701, IEC 62716, DIN EN 60068-2- 68)
- Long term reliability tests
- 2×100% EL inspection ensuring defect-free modules

Linear Performance Warranty



12 Years Product Warranty 30 Years Linear Power Warranty

* Please refer to GCL standard warranty for details

* Please refer to GCL for details

GCL-M3/72DH

Bifacial Monocrystalline Module

375-410W

Electrical Specification (STC*)

Test Condition		Front	Rear	Front	Rear	Front	Rear	Front	Rear	Front	Rear	Front	Rear	Front	Rear	Front	Rear
Maximum Power	Pmax(W)	375	265	380	269	385	272	390	276	395	279	400	283	405	286	410	290
Maximum Power Voltage	Vmp(V)	39.98	40.38	40.17	40.57	40.36	40.76	40.55	40.95	40.73	41.13	40.90	41.30	41.08	41.48	41.25	41.65
Maximum Power Current	Imp(A)	9.38	6.57	9.46	6.62	9.54	6.68	9.62	6.73	9.70	6.79	9.78	6.85	9.86	6.90	9.94	6.96
Open Circuit Voltage	Voc(V)	48.28	47.58	48.47	47.77	48.66	47.96	48.85	48.15	49.03	48.33	49.20	48.50	49.37	48.67	49.54	48.84
Short Circuit Current	Isc(A)	9.88	6.94	9.96	6.99	10.04	7.05	10.12	7.10	10.20	7.16	10.28	7.22	10.36	7.27	10.44	7.33
Module Efficiency	(%)	18.4	13.0	18.7	13.2	18.9	13.4	19.2	13.5	19.4	13.7	19.6	13.9	19.9	14.1	20.1	14.2
Power Output Tolerance	(W)	0~+5															

* Irradiance 1000W/m², Module Temperature 25°C, Air Mass 1.5

Electrical Specification (NOCT*)

Test Condition		Front	Rear	Front	Rear	Front	Rear	Front	Rear	Front	Rear	Front	Rear	Front	Rear	Front	Rear
Maximum Power	Pmax (W)	279.74	196.94	283.49	199.50	287.26	202.07	291.06	204.66	294.88	207.26	298.72	209.88	302.59	212.50	306.48	215.12
Maximum Power Voltage	Vmp (V)	37.20	37.30	37.40	37.50	37.60	37.70	37.80	37.90	38.00	38.10	38.20	38.30	38.40	38.50	38.60	38.70
Maximum Power Current	Imp (A)	7.52	5.28	7.58	5.32	7.64	5.36	7.70	5.40	7.76	5.44	7.82	5.48	7.88	5.52	7.94	5.56
Open Circuit Voltage	Voc(V)	45.00	44.40	45.20	44.60	45.40	44.80	45.60	45.00	45.80	45.20	46.00	45.40	46.20	45.60	46.40	45.80
Short Circuit Current	Isc (A)	7.98	5.60	8.04	5.64	8.10	5.68	8.16	5.72	8.22	5.76	8.28	5.80	8.34	5.84	8.40	5.88

* Irradiance 800W/m², Ambient Temperature 20°C, Wind Speed 1m/s

Mechanical Data

Number of Cells	144 Cells (6×24)
Dimensions of Module L*W*H (mm)	2036×1000×35mm (80.16×39.37×1.38 inches)
Weight (kg)	23.4 kg
Glass	High transparency solar glass 3.2mm (0.13 inches)
Backsheet	Use Tedlar® PVF film produced by DUPONT
Frame	Silver, anodized aluminium alloy
J-Box	IP68 Rated
Cable	4.0mm² (0.006 inches²), Portrait: 200/200mm (7.87 inches)
Number of diodes	3
Wind/Snow Load	2400Pa/ 5400Pa*
Connector	MC Compatible

* For more details please check the installation manual of GCLSI

Temperature Ratings

Nominal Operating Cell Temperature (NOCT)	44±2°C
Temperature Coefficient of Isc	+0.06%/°C
Temperature Coefficient of Voc	-0.30%/°C
Temperature Coefficient of Pmax	-0.39%/°C

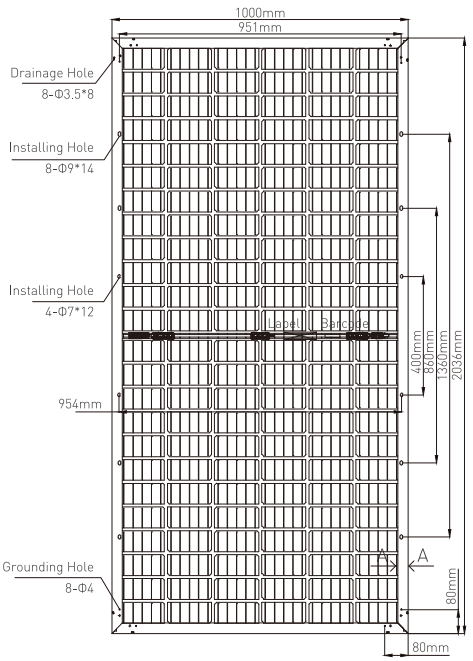
Maximum Ratings

Operational Temperature	-40~+85°C
Maximum System Voltage	1500V DC
Max Series Fuse Rating	25A

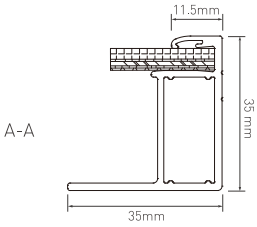
Packaging Configuration

Module per box	30 pieces
Module per 40' container	660 pieces

Module Dimension

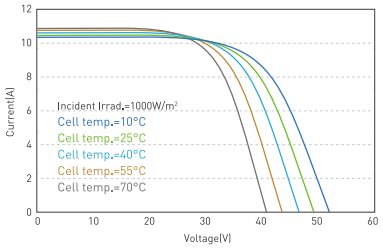


Back View

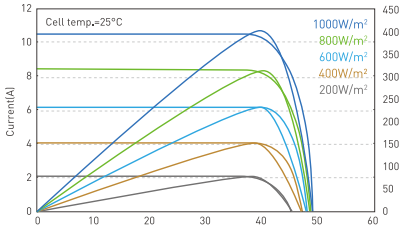


A-A

I-V Curve at Different Temperature (410W)



I-V/P-V Curve at Different Irradiation (410W)



CAUTION: READ INSTALLATION MANUAL BEFORE USING THE PRODUCT

Contact Us for More Information

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