

HYUNDAI SOLAR MODULE

DG
SERIES

G12 PERC Shingled

HiE-S410DG(FB) HiE-S415DG(FB)
HiE-S420DG(FB) HiE-S425DG(FB)



Shingled
Technology



For Both Residential
& Commercial
Applications



More Power
Generation
In Low Light



G12 PERC Shingled

G12 PERC Shingled Technology provides ultra-high efficiency with better performance in low irradiation. Maximizes installation capacity in limited space.



Anti-LID / PID

Both LID(Light Induced Degradation) and PID(Potential induced Degradation) are strictly eliminated to ensure higher actual yield during lifetime.



Mechanical Strength

Tempered glass and reinforced frame design withstand rigorous weather conditions such as heavy snow and strong wind.



Reliable Warranty

Global Brand with powerful financial strength provide reliable 25-year warranty. (Australia and Europe Only)



Corrosion Resistant

Various tests under harsh environmental conditions such as ammonia and salt-mist passed



UL / VDE Test Labs

Hyundai's R&D center is an accredited test laboratory of both UL and VDE.

Hyundai's Warranty Provisions



• **25-Year Product Warranty**
• On material and workmanship
Australia and Europe Only



• **25-Year Performance Warranty**
• Initial year: 98.0%
• Linear warranty after second year:
with 0.55%p annual degradation,
84.80% is guaranteed up to 25 years

About Hyundai Energy Solutions

Established in 1972, Hyundai Heavy Industries Group is one of the most trusted names in the heavy industries sector and is a Fortune 500 company. As a global leader and innovator, Hyundai Heavy Industries is committed to building a future growth engine by developing and investing heavily in the field of renewable energy.

As a core energy business entity of HHI, Hyundai Energy Solutions has strong pride in providing High-quality PV products to more than 3,000 customers worldwide.

Certification



Electrical Characteristics

		Mono-Crystalline Module (HiE-S__DG(FB))			
		425	420	415	410
Nominal Output (Pmpp)	W	425	420	415	410
Open Circuit Voltage(Voc)	V	41.7	41.6	41.5	41.4
Short Circuit Current (Isc)	A	13.03	12.92	12.80	12.65
Voltage at Pmax (Vmpp)	V	34.6	34.5	34.4	34.4
Current at Pmax (Imp)	A	12.30	12.19	12.08	11.97
Module Efficiency	%	21.4	21.1	20.9	20.6
Cell Type	-	PERC Mono-Crystalline Silicon Shingled			
Maximum System Voltage	V	1,500			
Temperature Coefficient of Pmax	%/°C	-0.34			
Temperature Coefficient of Voc	%/°C	-0.27			
Temperature Coefficient of Isc	%/°C	0.04			

*All data at STC(Standard Test Conditions). Above data may be changed without prior notice.

*Tolerance of Pmax:0~+5W.

* Performance deviation of Voc [V], Isc [A], Vm[V] and Im[A]: ±3%.

Mechanical Characteristics

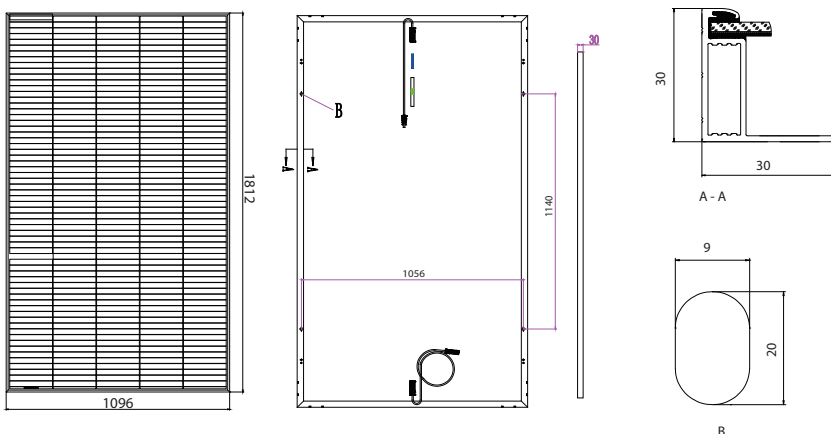
Dimensions	1,812 × 1,096 × 30 mm (L × W × H)		
Weight	20.8kg		
Solar Cells	305 Cells, PERC Mono-crystalline Shingled (210 × 210mm)		
Output Cables	4mm ² , +500mm/-1100mm(Vertical), +220mm/-180mm(Horizontal)	Connector	Stäubli : MC4-Evo2
Junction Box	IP68, TUV&UL, two diodes		
Construction	Front Glass: AR Coated tempered glass, 3.2mm Encapsulation: EVA (Ethylene-Vinyl-Acetate)		
Frame	Anodized Aluminum		

Installation Safety Guide

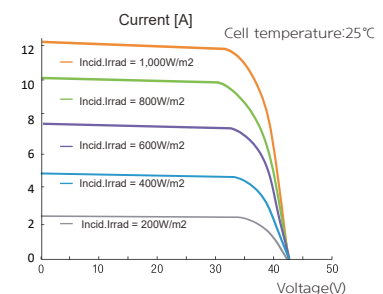
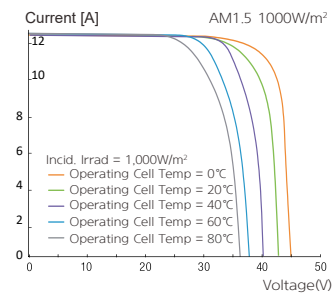
- Only qualified personnel should install or perform maintenance.
- Be aware of dangerous high DC voltage.
- Do not damage or scratch the rear surface of the module.
- Do not handle or install modules when they are wet.

Nominal Operating Cell Temperature	42.3°C (±2°C)
Operating Temperature	-40 ~ 85 °C
Maximum System Voltage	DC 1,500 / 1,000 (IEC)
Series Fuse Rating [A]	25
Maximum Surface Load Capacity	Front 5,400 Pa Rear 2,400 Pa

Module Diagram (Unit: mm)



I-V Curves



Manufactured in China

HYUNDAI
ENERGY SOLUTIONS



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LIO II-4810 is Lithium-ion battery module specially designed for energy storage system with 48V system

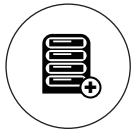
- Lithium Iron Phosphate (LFP) cell guarantees safety and reliability
- Easy to install on the floor
- Suitable for wide range of inverters with 48V system



Compact size and Lightweight
Built-in Lithium Iron Phosphate (LFP) cell with less space and weight.



Fast charging
Battery module can be fully charged in shorter time.

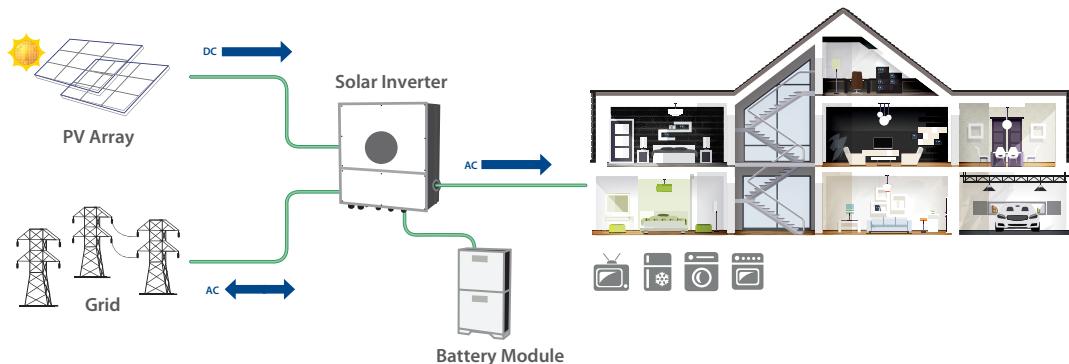


Modular design for easy scalable
Battery module can be easily stacked and added for energy expansion.

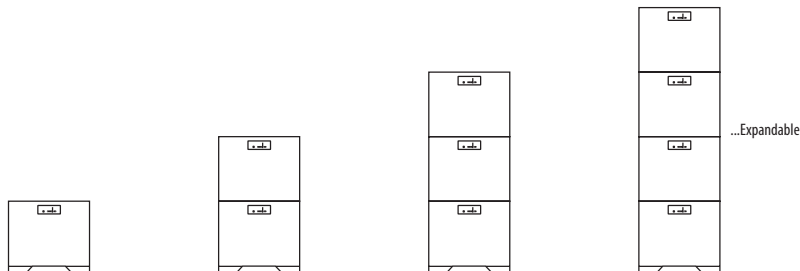


Maximum Lifecycle
8000 cycles is for 60% DOD with >50% capacity
2000 cycles is for 90% DOD with >80% capacity

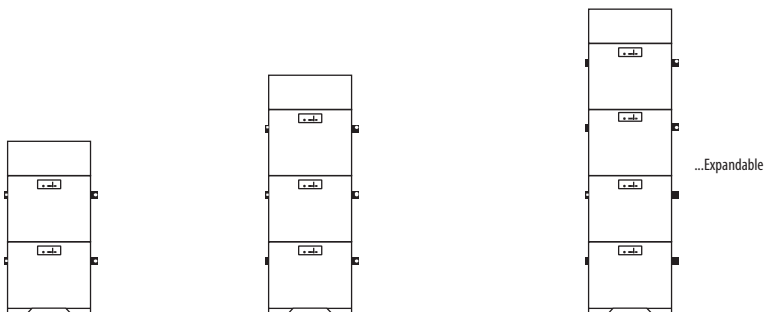
System Diagram



Technical Selection Guide



Battery Module	LIO II-4810 (5 kWh, 51.2V)			
Battery Cell Technology	Lithium Iron Phosphate			
Applicable Inverter Rating	≤ 5.6 kW			
Number of Module	1	2	3	4
Usable Energy	5 kWh	10 kWh	15 kWh	20 kWh
Rated Discharging Current	150 A	150 A	150 A	150 A
Peak Discharging Current	192 A, 1 min	192 A, 1 min	192 A, 1 min	192 A, 1 min
Nominal Voltage	51.2 V	51.2 V	51.2 V	51.2 V
Operating Voltage	40 -56 VDC	40 -56 VDC	40 -56 VDC	40 -56 VDC
Charging Current	100A Max, 30A Default	100A Max, 30A Default	100A Max, 30A Default	100A Max, 30A Default
Dimension, D x W x H (mm) without feet	185 x 540 x 420	185 x 540 x 840	185 x 540 x 1260	185 x 540 x 1680
Net Weight (kg)	48	96	144	192



Battery Module	LIO II-4810 (5 kWh, 51.2V)		
Battery Cell Technology	Lithium Iron Phosphate		
Applicable Inverter Rating	6 kW ~ 12 kW		
Number of Module	2	3	4
Number of PDU Module	1	1	1
Usable Energy	10 kWh	15 kWh	20 kWh
Rated Discharging Current	300 A	300 A	300 A
Peak Discharging Current	384 A, 1 min	384 A, 1 min	384 A, 1 min
Nominal Voltage	51.2 V	51.2 V	51.2 V
Operating Voltage	40 - 56 VDC	40 - 56 VDC	40 - 56 VDC
Dimension, D x W x H (mm) without feet	185 x 540 x 1040	185 x 540 x 1460	185 x 540 x 1880
Net Weight (kg)	102	150	198

General Specification

Operation Temperature	Charge	0°C~50 °C
	Discharge	0°C~50 °C
Storage Temperature (At 50% SOC and specified temp, recoverable capacity in % vs time / 50%)	< 18 months:	-20°C~25 °C
	< 3 months:	25°C~45 °C
	< 1 months:	45°C~60 °C
	20°C ± 5 °C is the recommended storage temperature	
IP Protection	IP20	
Communication	RS485 port (RJ45), CAN	
Certifications	UN38.3, IEC 62619	

Product specifications are subject to change without further notice.

Axpert VM 4 TWIN Off-Grid Inverter



- Dual output for smart load management
- Maximum PV input current 27A
- Wide PV input voltage range 60VDC~450VDC
- Customizable status LED ring with RGB lights
- Touchable button with large 4.3" colored LCD
- Built-in Wifi for mobile monitoring (Android/iOS App available)
- Supports USB On-the-Go function
- Data log event stored in the inverter
- Reserved communication port (RS485, CAN-BUS or RS232) for BMS
- Battery independent design
- Battery equalization extends lifecycle
- Enhanced charging power
- Built-in anti-dust kit

Axpert VM 4 TWIN Off-Grid Inverter Selection Guide

MODEL	Axpert VM 4 TWIN 4K	Axpert VM 4 TWIN 6K
RATED POWER	4000VA/4000W	6000VA/6000W
INPUT		
Voltage	230 VAC	
Selectable Voltage Range	170-280 VAC (For Personal Computers) 90-280 VAC (For Home Appliances)	
Frequency Range	50 Hz/60 Hz (Auto sensing)	
OUTPUT		
AC Voltage Regulation (Batt. Mode)	230VAC \pm 10%	
Surge Power	8000VA	12000VA
Efficiency (Peak)	90% ~ 93%	
Transfer Time	10 ms (For Personal Computers) 20 ms (For Home Appliances)	
Waveform	Pure sine wave	
BATTERY		
Battery Voltage	24 VDC	48 VDC
Floating Charge Voltage	27 VDC	54 VDC
Overcharge Protection	33 VDC	63 VDC
SOLAR CHARGER & AC CHARGER		
Solar Charger type	MPPT	
Maximum PV Array Power	5000W	6000W
MPP Range @ Operating Voltage	60 ~ 450 VDC	60 ~ 450 VDC
Maximum PV Array Open Circuit Voltage	500 VDC	500 VDC
Maximum PV Input Current	27A	
Maximum Solar Charge Current	120A	120A
Maximum AC Charge Current	100A	100A
Maximum Charge Current	120A	120A
PHYSICAL		
Dimension, D x W x H (mm)	119 x 313.6 x 457.5	
Net Weight (kgs)	10	12
Communication Interface	USB/RS232/RS485/WiFi/Dry-contact	
OPERATING ENVIRONMENT		
Humidity	5% to 95% Relative Humidity (Non-condensing)	
Operating Temperature	-10°C to 50°C	
Storage Temperature	-15°C to 60°C	

Product specifications are subject to change without further notice.