

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

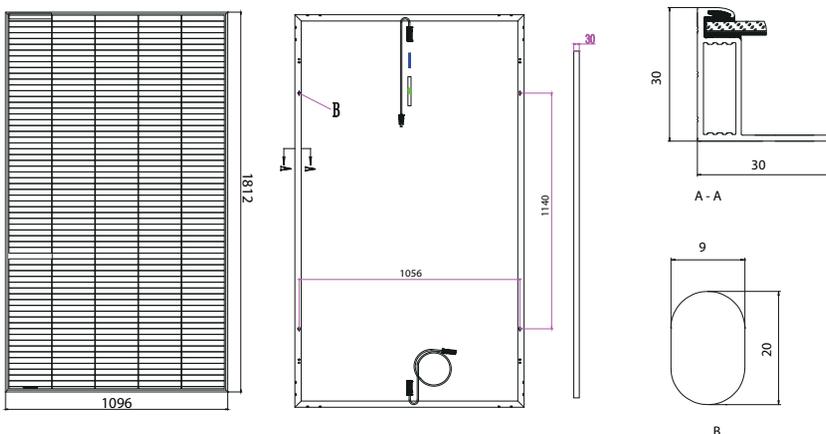
Dimensions	1,812 × 1,096 × 30 mm (L × W × H)		
Weight	20.8kg		
Solar Cells	305 Cells, PERC Mono-crystalline Shingled (210 × 210mm)		
Output Cables	4mm ² , +500mm/-1100mm(Vertical), +220mm/-180mm(Horizontal)	Connector	Stäubli : MC4-Evo2
Junction Box	IP68, TUV&UL, two diodes		
Construction	Front Glass: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

Installation Safety Guide

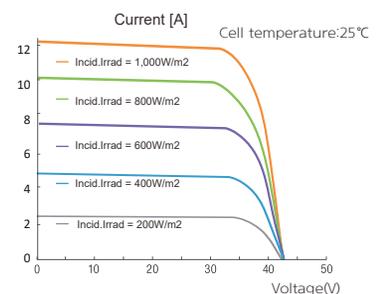
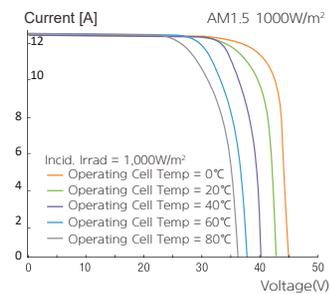
- Only qualified personnel should install or perform maintenance.
- Be aware of dangerous high DC voltage.
- Do not damage or scratch the rear surface of the module.
- Do not handle or install modules when they are wet.

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

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ENERGY SOLUTIONS



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Printed Date : 07/2022

GOODWE

ES G2 Series

3-6kW | Single Phase | 2 MPPTs Hybrid inverter (LV)

The GoodWe ES G2 inverter, ranging from 3 to 6kW, is a single-phase hybrid inverter designed to increase self-consumption of the generated solar energy, with the ability to control the flow of energy intelligently. The inverter can automatically realize UPS-level switching to the back-up mode in less than 10ms, with strong backup ability to withstand heavy loads like air conditioners. Its smart design also offers great flexibility for demanding scenarios as it supports parallel connection for dependable backup power supply. Featured with plug-and-play, compact design, and minimal weight, PV installations are quicker and easier to complete than ever before. Importantly, ES G2 is compatible with a wide range of low voltage batteries such as GoodWe Lynx Home U battery. For homeowners looking to achieve a high degree of energy autonomy, reliable power supply and affordable energy prices, the ES G2 is the right choice.



Smart Control & Monitoring

- Smart load control with dry contacts
- Smart home integration with multi-protocol communications



Friendly & Thoughtful Design

- Plug & Play
- Elegant and compact design



Superb Safety & Reliability

- Optional AFCI on DC side¹
- Remote Shutdown



Flexible & Adaptable Applications

- Maximum 16A DC input current per string and high-power module compatibility
- Strong backup power supply

1: Optional functions or devices are purchased separately.

Technical Data	GW3000-ES-20	GW3600-ES-20	GW3600M-ES-20	GW5000-ES-20	GW5000M-ES-20	GW6000-ES-20	GW6000M-ES-20
Battery Input Data							
Battery Type ¹	Li-Ion						
Nominal Battery Voltage (V)	48						
Battery Voltage Range (V)	40 ~ 60						
Max. Continuous Charging Current (A) ¹	60	75	60	120	60	120	60
Max. Continuous Discharging Current (A) ¹	60	75	60	120	60	120	60
Max. Charge Power (W) ¹	3000	3600	3000	5000	3000	6000	3000
Max. Discharge Power (W)	3200	3900	3200	5300	3200	6300	3200
PV String Input Data							
Max. Input Power (W) ²	4500	5400	5400	7500	7500	9000	9000
Max. Input Voltage (V)	600						
MPPT Operating Voltage Range (V)	60 ~ 550						
Start-up Voltage (V)	58						
Nominal Input Voltage (V)	360						
Max. Input Current per MPPT (A)	16						
Max. Short Circuit Current per MPPT (A)	23						
Number of MPP Trackers	1	2	2	2	2	2	2
Number of Strings per MPPT	1						
AC Output Data (On-grid)							
Nominal Apparent Power Output to Utility Grid (VA)	3000	3680	3680	5000 ³	5000 ³	6000 ³	6000 ³
Max. Apparent Power Output to Utility Grid (VA)	3000	3680	3680	5000 ³	5000 ³	6000 ³	6000 ³
Max. Apparent Power from Utility Grid (VA)	6000	7360	3680	10000	5000	10000	6000
Nominal Output Voltage (V)	220 / 230 / 240						
Nominal AC Grid Frequency (Hz)	50 / 60						
Max. AC Current Output to Utility Grid (A)	13.6	16.7	16.7	22.7	22.7	27.3	27.3
Max. AC Current From Utility Grid (A)	27.3	33.5	16.7	43.5	22.7	43.5	27.3
Power Factor	~1 (Adjustable from 0.8 leading to 0.8 lagging)						
Max. Total Harmonic Distortion	<3%						
AC Output Data (Back-up)							
Back-up Nominal Apparent Power (VA)	3000	3680	3680	5000	5000	6000	6000
Max. Output Apparent Power (VA)	3000 (6000@10sec)	3680 (7360@10sec)	3680	5000 (10000@10sec)	5000	6000 (10000@10sec)	6000
Max. Output Current (A)	13.6	16.7	16.7	22.7	22.7	27.3	27.3
Nominal Output Voltage (V)	220 / 230 / 240						
Nominal Output Frequency (Hz)	50 / 60						
Output THDv (@Linear Load)	<3%						
Efficiency							
Max. Efficiency	97.6%						
European Efficiency	96.7%						
Max. Battery to AC Efficiency	95.5%						
MPPT Efficiency	99.9%						
Protection							
PV String Current Monitoring	Integrated						
PV Insulation Resistance Detection	Integrated						
Residual Current Monitoring	Integrated						
PV Reverse Polarity Protection	Integrated						
Anti-islanding Protection	Integrated						
AC Overcurrent Protection	Integrated						
AC Short Circuit Protection	Integrated						
AC Overvoltage Protection	Integrated						
DC Switch	Integrated						
DC Surge Protection	Type II						
AC Surge Protection	Type III						
AFCI	Optional						
Remote Shutdown	Integrated						
General Data							
Operating Temperature Range (°C)	-25 ~ +60						
Relative Humidity	0 ~ 95%						
Max. Operating Altitude (m)	3000 (>2000 Derating)						
Cooling Method	Natural Convection						
Display	LED, WLAN + APP						
Communication with BMS	CAN						
Communication with Meter	RS485						
Communication with Portal	WiFi / WiFi + LAN / 4G						
Weight (kg)	19.6	20.8	20.0	21.5	20.0	21.5	20.0
Dimension (W x H x D mm)	505.9 x 434.9 x 154.8						
Topology	Non-isolated						
Self-consumption at Night (W)	<10						
Ingress Protection Rating	IP65						
Mounting Method	Wall Mounted						

*1: The actual charge and discharge current / power also depends on the battery.

*2: The max power is the actual power of PV.

*3: 4600 for VDE-AR-N4105 & NRS 097-2-1.

*: Please visit GoodWe website for the latest certificates.

*: All pictures shown are for reference only. Actual appearance may vary.

Lynx Home U Series

5.4-32.4kWh | Low voltage battery

Lynx Home U Series is a low-voltage lithium battery specially designed for residential applications with superior performance. Compatible with GoodWe ES/EM/SBP inverters, Lynx Home U Series comes with GoodWe one-stop-shop solution saving you considerable time and effort. It can be used flexibly for self-consumption and backup applications with a wide capacity range scalable from 5.4 – 32.4kWh. The installation and commissioning are easier and faster than ever with a simple Plug and Play wiring and module auto recognition during system setup. Meet this highly efficient solution for storing your solar power and use it whenever needed.



Smart Control

- Remote diagnosis & update
- Auto reboot after undervoltage



Friendly & Thoughtful Design

- Auto-recognition modules
- Plug & Play wiring



Superb Safety & Reliability

- Reliable LFP technology with high cycle stability
- IP65 protection for outdoor installation safety



Flexible & Adaptable Applications

- 5.4 – 32.4kWh wide capacity range
- Compatible with GoodWe ES/EM/SBP inverters

Technical Data	LX U5.4-L	2*LX U5.4-L	3*LX U5.4-L	4*LX U5.4-L	5*LX U5.4-L	6*LX U5.4-L
Rated Energy (kWh) ¹	5.4	10.8	16.2	21.6	27.0	32.4
Usable Energy (kWh) ²	4.8	9.6	14.4	19.2	24.0	28.8
Cell Type	LFP (LiFePO4)					
Nominal Voltage (V)	51.2					
Operating Voltage Range (V)	48 ~ 57.6					
Nominal Dis- / Charge Current (A) ³	50	100	100	100	100	100
Nominal Power (kW) ³	2.88	5.76	5.76	5.76	5.76	5.76
Communication	CAN					
Weight (kg)	57	114	171	228	285	342
Dimensions (W x H x D mm)	505 x 570 x 175 (LX U5.4-L)					
Operating Temperature Range (°C)	Charge: 0 ~ +50 / Discharge: -10 ~ +50					
Relative Humidity	0 ~ 95%					
Max. Operating Altitude (m)	2000					
Ingress Protection Rating	IP65					
Mounting Method	Wall Mounted / Grounded					
Standard and Certification	Safety	IEC62619, IEC62040, CEC				
	EMC	CE, RCM				
	Transportation	UN38.3				

*1: Test conditions, cell Voltage 2.5 ~ 3.65V, 0.5C charge & discharge at +25 ±2°C for battery system at beginning life. System Usable Energy may vary with different Inverter.

*2: Test conditions, 90% DOD, 0.5C charge & discharge at +25 ±2°C.

*3: Nominal Dis- / Charge Current and power derating will occur related to Temperature and SOC.

*: Please visit GoodWe website for the latest certificates.