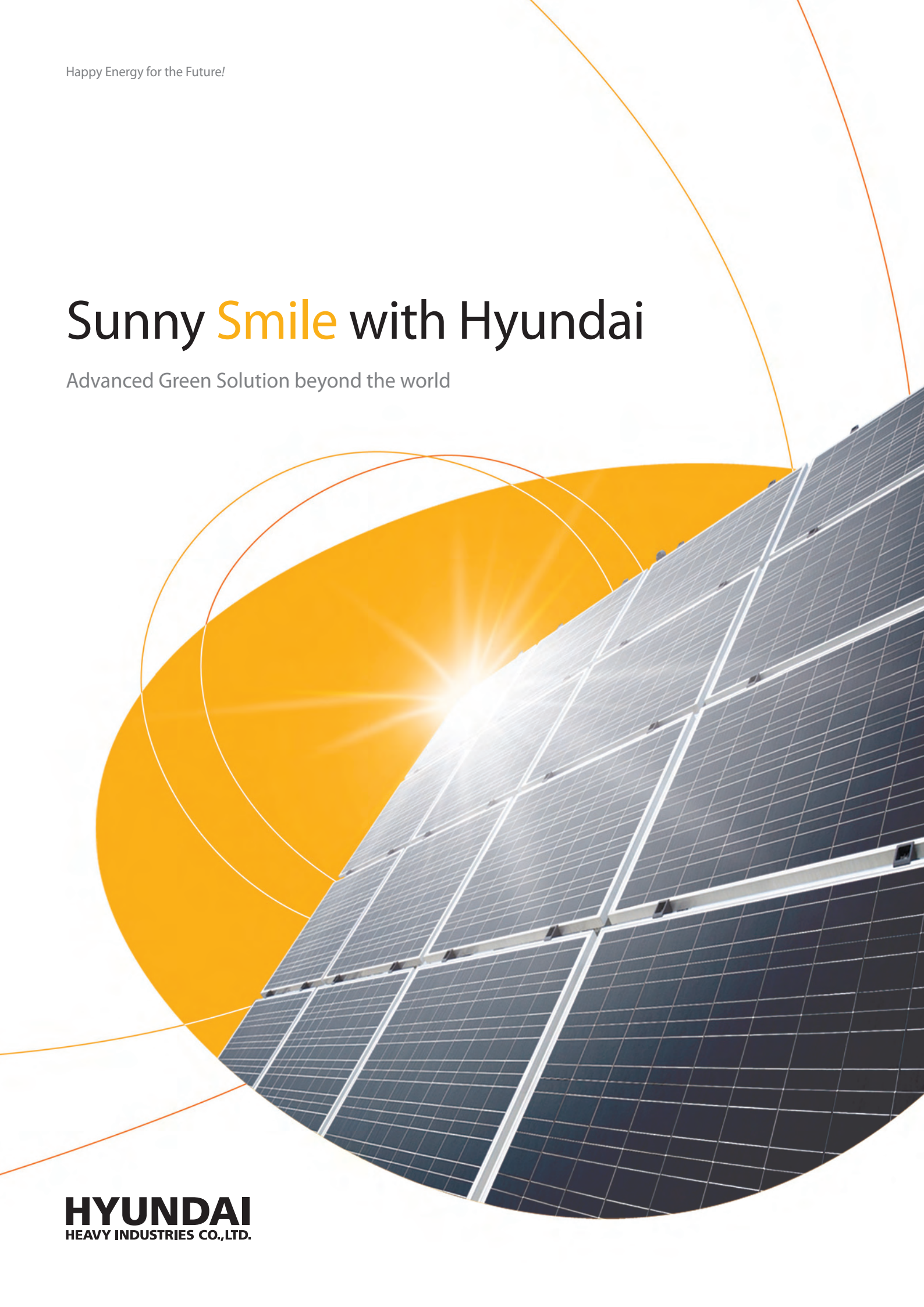


Happy Energy for the Future!

Sunny **Smile** with Hyundai

Advanced Green Solution beyond the world

HYUNDAI
HEAVY INDUSTRIES CO.,LTD.





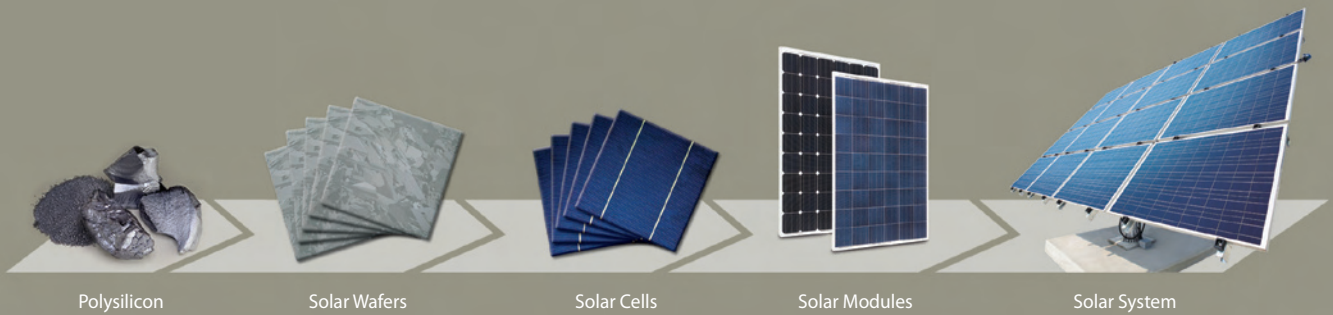
Hyundai Heavy Industries' Happy Energy for the Future

Hyundai Heavy Industries provides green solution for happy energy.
Happy energy makes this green planet greener.



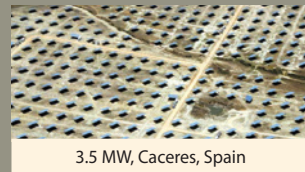
Solar Power Systems

Value Chain of HYUNDAI's Solar business

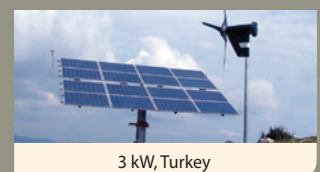
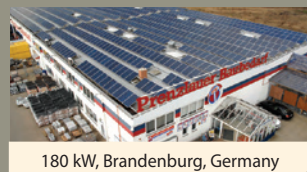


Major References

► Power Plants



► Others



Operating Environment

Nominal Operating Cell Temperature	46°C ± 2
Operating Temperature	-40 - 85°C
Maximum System Voltage	DC 1,000 V (IEC) DC 600 V (UL)

High Quality

- IEC 61215 (Ed.2) and IEC 61730 by TÜV Rheinland
- UL listed (UL 1703), Class C Fire Rating
- Output power tolerance +3/-0 %
- ISO 9001:2000 and ISO 14001:2004 Certified
- Advanced Mechanical Test (5,400 Pa) Passed (IEC) / Mechanical Load Test (40 lbs/ft²) Passed (UL)
- Ammonia Corrosion Resistance Test Passed
- IEC 61701 (Salt Mist Corrosion Test) Passed

Limited Warranty

- 10 years for product defect
- 10 years for 90 % of warranted min. power
- 25 years for 80 % of warranted min. power

MF Series

Mechanical Characteristics

Dimensions	983 mm (38.7") (W) X 1,476 mm (58.11") (L) X 35 mm (1.38") (H)
Weight	Approx. 16.6 kg (36.6 lbs)
Solar cells	54 cells in series (6 X 9 matrix)
Output cables	4 mm ² (12AWG) cables with polarized weatherproof connectors, IEC certified (UL listed), Length 1.0 m (39.4")
Junction box	IP65, weatherproof, IEC certified (UL listed)
Bypass diodes	3 bypass diodes to prevent power decrease by partial shade
Construction	Front : High transmission low-iron tempered glass, 3.2 mm (0.126") Encapsulant : EVA Back Sheet : Weatherproof film
Frame	Clear anodized aluminum alloy type 6063



Electrical Characteristics

► Mono-crystalline Type

		HiS-S□□□MF				
		220	225	230	235	240
Nominal output (Pmpp)	W	220	225	230	235	240
Voltage at Pmax (Vmpp)	V	27.6	27.8	28.1	28.3	28.6
Current at Pmax (Impp)	A	8.0	8.1	8.2	8.3	8.4
Open circuit voltage (Voc)	V	33.6	33.7	33.8	33.9	34.0
Short circuit current (Isc)	A	8.5	8.6	8.7	8.8	8.9
Output tolerance	%	+3/-0				
No. of cells & connections	pcs	54 in series				
Cell type	-	6" Mono-crystalline silicon				
Module efficiency	%	15.2	15.5	15.9	16.2	16.5
Temperature coefficient of Pmpp	%/K	-0.45	-0.45	-0.45	-0.45	-0.45
Temperature coefficient of Voc	%/K	-0.33	-0.33	-0.33	-0.33	-0.33
Temperature coefficient of Isc	%/K	0.032	0.032	0.032	0.032	0.032

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

MG Series

Mechanical Characteristics

Dimensions	983 mm (38.7")(W) X 1,645 mm (64.76")(L) X 35 mm (1.38")(H)
Weight	Approx. 18.5 kg (40.8 lbs)
Solar cells	60 cells in series (6 X 10 matrix)
Output cables	4 mm ² (12AWG) cables with polarized weatherproof connectors, IEC certified (UL listed), Length 1.0 m (39.4")
Junction box	IP65, weatherproof, IEC certified (UL listed)
Bypass diodes	3 bypass diodes to prevent power decrease by partial shade
Construction	Front : High transmission low-iron tempered glass, 3.2 mm (0.126") Encapsulant : EVA Back Sheet : Weatherproof film
Frame	Clear anodized aluminum alloy type 6063



Electrical Characteristics

► Multi-crystalline Type

		HIS-M□□□MG				
		230	235	240	245	250
Nominal output (Pmpp)	W	230	235	240	245	250
Voltage at Pmax (Vmpp)	V	30.1	30.3	30.5	30.7	30.9
Current at Pmax (Impp)	A	7.7	7.8	7.9	8.0	8.1
Open circuit voltage (Voc)	V	37.1	37.4	37.7	38.0	38.2
Short circuit current (Isc)	A	8.2	8.3	8.3	8.4	8.6
Output tolerance	%	+3/-0				
No. of cells & connections	pcs	60 in series				
Cell type	-	6" Multi-crystalline silicon				
Module efficiency	%	14.2	14.5	14.8	15.2	15.5
Temperature coefficient of Pmpp	%/K	-0.43	-0.43	-0.43	-0.43	-0.43
Temperature coefficient of Voc	%/K	-0.32	-0.32	-0.32	-0.32	-0.32
Temperature coefficient of Isc	%/K	0.048	0.048	0.048	0.048	0.048

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

► Mono-crystalline Type

		HIS-S□□□MG				
		245	250	255	260	265
Nominal output (Pmpp)	W	245	250	255	260	265
Voltage at Pmax (Vmpp)	V	30.3	30.5	30.8	31.0	31.2
Current at Pmax (Impp)	A	8.1	8.2	8.3	8.4	8.5
Open circuit voltage (Voc)	V	37.4	37.5	37.7	37.8	37.9
Short circuit current (Isc)	A	8.6	8.7	8.8	8.9	9.0
Output tolerance	%	+3/-0				
No. of cells & connections	pcs	60 in series				
Cell type	-	6" Mono-crystalline silicon				
Module efficiency	%	15.2	15.5	15.8	16.1	16.4
Temperature coefficient of Pmpp	%/K	-0.45	-0.45	-0.45	-0.45	-0.45
Temperature coefficient of Voc	%/K	-0.33	-0.33	-0.33	-0.33	-0.33
Temperature coefficient of Isc	%/K	0.032	0.032	0.032	0.032	0.032

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

Hyundai Solar Inverters

Features

- Compact design, lightweight, and easy installation
- Maximum efficiency with high performance MPPT control
- Increased flexibility due to a wide range of MPPT tracking
- Remote and local data monitoring
- LCD display of operating status
- Anti-islanding protection
- Issued CE and TÜV certificate, ENEL 2009 certificate, MEA & PEA (Thailand) certificate, RD1663 certificate (50 kW, 100 kW, 250 kW and 500 kW class)
- Support 5 year standard warranty + 20 year extended warranty



Technical Specifications & Product Overview

Model	HPC-003SL-K2	HPC-004SL	HPC-100HL	HPC-125HL	HPC-250HL	HPC-500HL-K1	HPC-050HT-E	HPC-100HT-E	HPC-250HT-E	Solar Station	
											HPS-500MT
System Overview											
Phase	1-Phase					3-Phase					
Output Operating Method	Grid-Tied										
Design Concept	Transformer-less						Low-Frequency Transformer			Medium Voltage Transformer, MV Switchgear	
							(Δ-Y)	(Δ-Y)	(Y-Δ)		
Input Data											
Max. Input Voltage	550 Vdc	380 Vdc	880 Vdc	880 Vdc	1,000 Vdc	1,000 Vdc	700 Vdc	700 Vdc	900 Vdc	1,000 Vdc	1,000 Vdc
Nominal Voltage	380 Vdc	250 Vdc	635 Vdc	635 Vdc	650 Vdc	650 Vdc	450 Vdc	450 Vdc	635 Vdc	650 Vdc	650 Vdc
MPPT Voltage Range	170-550 Vdc	100-380 Vdc	450-820 Vdc	450-820 Vdc	450-820 Vdc	550-820 Vdc	300-600 Vdc	300-600 Vdc	450-820 Vdc	450-820 Vdc	550-820 Vdc
Max. Input Current	18 Adc	25 Adc	234 Adc	292 Adc	625 Adc	1,030 Adc	175 Adc	350 Adc	580 Adc	2 x 625 Adc	2 x 1,030 Adc
Output Data											
Nominal AC Power	3 kW	4 kW	100 kW	125 kW	250 kW	500 kW	50 kW	100 kW	250 kW	500 kW	1,000 kW
Nominal AC Voltage	220 V, +10/-12 %	202 V, +12/-12 %	290 V, +10/-12 %		270 V, +10/-12 %	350 V, +10/-12 %	400 V, +10/-12 %			22.9 kV, +10/-12 %	
Nominal AC Current	13.6 A	19.8 A	199 A	249 A	540 A	830 A	72 A	144 A	361 A	13 A	25 A
Maximum Output Current	16 A	21 A	226 A	283 A	608 A	940 A	80 A	160 A	410 A	14 A	29 A
Nominal AC Frequency	60 Hz	50/60 Hz					50/60 Hz				
THD of AC Current	Total ≤ 5 % (Each ≤ 3 %)						Total ≤ 5 % (Each ≤ 3 %)				
System Specification											
Max. Efficiency	96.9 %	95.6 %	98.0 %	98.0 %	98.0 %	98.6 %	95.8 %	97.4 %	97.8 %	97.0 %	97.0 %
European Efficiency	96.5 %	94.9 %	97.7 %	97.7 %	97.8 %	98.3 %	95.0 %	96.8 %	96.9 %	96.5 %	96.5 %
Power Factor	≥ 0.99	≥ 0.99	≥ 0.99	≥ 0.99	≥ 0.99	≥ 0.99	≥ 0.99	≥ 0.99	≥ 0.99	≥ 0.99	≥ 0.99
Protection Degree	IP65	IP20	IP20	IP20	IP20	IP20	IP20	IP20	IP20	IP54	IP54
Operating Temperature	-20 - 50°C	-10 - 40°C	-10 - 40°C	-10 - 40°C	-20 - 45°C	-20 - 50°C	-10 - 40°C	-10 - 40°C	-20 - 40°C	-20 - 50°C	-20 - 50°C
Dimension											
Width (mm)	340	480	1,000	1,000	1,800	2,600	800	1,000	2,200	5,300	5,600
Depth (mm)	155	120	800	800	750	800	700	800	850	3,000	3,000
Height (mm)	450	280	2,095	2,095	2,065	2,205	1,994	2,095	2,215	3,100	3,100
Weight	16.5 kg	14 kg	620 kg	620 kg	1,120 kg	1,550 kg	800 kg	1,250 kg	2,350 kg	-※※	-※※
Protective Functions	DC Over-/Under-Voltage, AC Line Over-/Under-Voltage, AC Line Frequency Failure, AC Line Failure, Anti-Islanding, Overheating, Ground Fault										

※ Specifications are subject to change without prior notice.

※※ Weight is adjustable according to the customer's specification.

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