### THE PERFECT POWER CONVERSION PARTNER

# HD HYUNDAI PLASPO

The competitiveness of our customers will be more upgrade with HD HYUNDAI PLASPO's energy total solutions









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The perfect power conversion partner for your new energy generation

## HD HYUNDAI PLASPO's Business Field with **2.9GW PCS sales references and 23 years know-how**

Renewable and ESS sector: **985MW**, Fusion Energy sector: **1,900MW** ESS PCS: **812MW**, ESS Battery: **2,030MWh** PV PCS & ESS PCS: **10 years**, Wind Power Generation PCS: **20 years**, Fuel Cell PCS: **15 years** Track Record



#### **Power Converter**

- · ESS PCS : PLABEX / PLADEX / PLAONE
- · PV Inverter : PLAVIX
- Fuel Cell Inverter : PLAFEX
- Hydroelectric Power Supplies : PLAGEN
- Power module for electric vehicle chargers (under development)

#### **EV Charger**

- · Slow: 7kW, 14kW
- · Fast: 50kW, 100kW
- · Ultra-fast: 200kW, 350kW
- Custom specification charger HW & SW
   OEM development
- Site-specific design and construction permit processing
- · Installation and completion

#### **Engineering Services**

- $\cdot$  Integrated O&M (PLANET service)
- Grid Compatibility Assessment Consulting GCC Certification (FRT)

#### UPS

- · AC UPS
- Battery Charger
- · AVR
- Rectifiers
  - Instantaneous power outage compensator (DVC)

#### Renewable Energy Development (IPP)

- $\cdot$  Photovoltaic Power Generation
- $\cdot$  Fuel Cell System Power Generation
- $\cdot$  Energy Superstations

## **01** ESS PCS PLABEX-Series

Proven by years of operation at more than 500 sitesthe most efficient, most reliable PCS for ESS in Korea.

Model	PLADEX-50K	Model	PLABEX-H250K
	***		
Input (DC)		Input (DC)	
Nominal Input Power [kW]	52.20	Max. DC Power [kW]	263
Max. Input Voltage [Vdc]	950	Max. DC Voltage [V]	1100
Max. Input Current [Adc]	90	Max. DC Current [A]	350
DC Voltage Range [Vdc]	580 ~ 850	DC Voltage Range [Vdc]	750 ~ 1100
Output (DC Grid)		Output (AC)	
Rated Output Power [kW]	50	Rated AC Power [kW]	250
Nominal Output Voltage [Vdc]	700 (Variable)	AC Voltage Range [V]	440 ± 10%
Max. Output Current [Adc]	90	Max. AC Current [A]	328
		Frequency [Hz]	60
		Current Harmonic [%]	Total<5 / Each<3
		Power Factor	≥0.99
		Grid Structure	3P3W (IT,TT)
General Data		General Data	
Max. Efficiency [%]	99.00	Max. Efficiency [%]	98.38
Cooling Principle	Forced Air Cooling	Cooling Principle	Forced Air Cooling
Operating Temperature [°C] [Derating over +40 °C (2%/1°C)]	-10℃ ~ +40℃	Operating Temperature [°C] [Derating over +40 °C (2%/1°C)]	-10°C ~ +40°C
Dimensions (W/D/H) [mm]	750 * 750 * 2008	Dimensions (W/D/H) [mm]	750 * 700 * 2059
Weight [kg]	650	Weight [kg]	650
IP Level	IP21	IP Level	IP21
Communication	Ethe	rnet(TCP/IP), CAN, RS-232/485	
Protection		OV, UV, OFR, OC, SC, etc.	
Standard	SGSF-025-4 / EM CISPR11: 2011, EMC EN61000-6-2, EN61000-4-2, 4, 6, 11, EN61000-6-4 / IEEE1547		

PLABEX-Series, Return more annual profits to our customer with proven 1% higher efficiency than other companies.

Model	PLABEX-H500K	PLABEX-H1M	PLABEX-H1.5M
Input (DC)			
Max. DC Power [kW]	525	1050	1575
Max. DC Voltage [V]	1100	1100	1100
Max. DC Current [A]	700	1400	2100
DC Voltage Range [Vdc]	750 ~ 1100	750 ~ 1100	750 ~ 1100
Output (AC)			
Rated AC Power [kW]	500	1000	1500
AC Voltage Range [V]	440 ± 10%	440 ± 10%	440 ± 10%
Max. AC Current [A]	656	1312	1968
Frequency [Hz]	60	60	60
Current Harmonic [%]	Total<5 / Each<3	Total<5 / Each<3	Total<5 / Each<3
Power Factor	≥0.99	≥0.99	≥0.99
Grid Structure	3P3W (IT, TT)	3P3W (IT, TT)	3P3W (IT, TT)
General Data			
Max. Efficiency [%]	98.15	98.28	98.20
Cooling Principle	Forced Air Cooling	Forced Air Cooling	Forced Air Cooling
Operating Temperature [°C] [Derating over +40 °C (2%/1°C)]	-10°C ~ +40°C / -20°C ~ +50°C	-10°C ~ +40°C / -20°C ~ +50°C	-10°C ~ +40°C / -20°C ~ +50°C
Dimensions (W/D/H) [mm]	1800 * 900 * 2040 1800 * 1020 * 2400	2400 * 900 * 2040 2400 * 1020 * 2400	3100 * 900 * 2040 3100 * 1020 * 2400
Weight [kg]	1500 / 1600	2000 / 2200	2900 / 3100
IP Level	IP21 / IP54	IP21 / IP54	IP21 / IP54
Communication		Ethernet (TCP/IP), CAN, RS-232/485	
Protection		OV, UV, OFR, OC, SC, etc.	
Standard	SGSF-025-4 / EM CISPR11: 2011	, EMC EN61000-6-2, EN61000-4-2, 4,	6, 11, EN61000-6-4 / IEEE1547

## **01** ESS PCS PLABEX-Series

### The quietly spreading word of mouth truth is a FACT.

06

The average 99% uptime is the confidence of HD Hyundai Plaspo.

Model	PLABEX-H2M-FR	PLABEX-H2.01M	PLABEX-H2.5M	PLABEX-2.3MH2
	CE			
Input (DC)				
Max. DC Power [kW]	2100	2111	2625	2415
Max. DC Voltage [V]	1100	1100	1100	1500
Max. DC Current [A]	2800	2815	3500	2257
DC Voltage Range [Vdc]	750 ~ 1100	750 ~ 1100	750 ~ 1100	915 ~ 1500
Output (AC)				
Rated AC Power [kW]	2000	2010	2500	2300
AC Voltage Range [V]	440±10%	440±10%	440±10%	580 ~ 690±10%
Max. AC Current [A]	2624	2638	3280	1925
Frequency [Hz]	50/60	60	60	60
Current Harmonic [%]	Total<5 / Each<3	Total<5 / Each<3	Total<5 / Each<3	Total<5 / Each<3
Power Factor	≥0.99	≥0.99	≥0.99	≥0.99
Grid Structure	3P3W (IT, TT)	3P3W (IT, TT)	3P3W (IT, TT)	3P3W (IT, TT)
General Data				
Max. Efficiency [%]	98.05	98.71	98.31	98.93
Cooling Principle	Forced Air Cooling	Forced Air Cooling	Forced Air Cooling	Forced Air Cooling
Operating Temperature [°C] [Derating over +40 °C (2%/1°C)]	-10℃ ~ +40 ℃	-20℃ ~+50℃	-20°C ~+50°C	-20℃ ~+50℃
Dimensions (W/D/H) [mm]	3800 * 800 * 2050	3800 * 900 * 2210 3800 * 1000 * 2400	4400 * 1000 * 2050 4400 * 1000 * 2400	3600 * 1220 * 2250
Weight [kg]	3280 / 3500	3500 / 3800	3800 / 4200	3000
IP Level	IP21	IP21 / IP54	IP21 / IP54	IP54
Communication		Ethernet (TCP/IP),	CAN, RS-232/485	·
Protection	OV, UV, OFR, OC, SC, etc.			
Standard	SGSF-025-4 / EM CISPR11: 2011, EN61000-4-2, 4, 6, 11, EMC EN61000-6-2, EN61000-6-4 / IEEE1547	SGSF-025	5-4 / EMC EN61000-6-2 / EN6	51000-6-4

## 02 Distributed Power-Connected Integrated Solution PALONE - Series

2020 KC Certification, DIstributed Power-Connected Integrated Solution PLAONE-Series is ab integrates system consisting of ESS PCS, DCP & ACP, Intelligent localmanagement system(L-PMS/EMS) and O&M service platform.(PLANET)

#### ESS PCS

- $\cdot$  Real-time remote monitoring & diagnostics
- $\cdot$  Highest efficiency and safety with 99% average uptime
- $\cdot$  Grid-connected and off-grid (non-emergency backup) modes

#### Intelligent Management System(L-PMS/EMS)

- Various operation modes
   (Peak shift, Micro-grid, Distributed power transfer)
- $\cdot$  ESS Safety information System Connection Support
- $\cdot$  Real-time operation information collection, monitoring and control

#### The PLAONE-Series offers a variety of solutions.

- ✓ Type 1 : ESSPCS + L-PMS/EMS + PLANET
- ✓ Type 2 : ESSPCS + DCP+ACP+ L-PMS/EMS + PLANET

#### Integrated O&M Service Platform(PLANET)

- $\cdot$  Failure analysis and countermeasure elicitation service
- $\cdot$  Real-time monitoring and advanced predictive diagnostic algorithm
- Product management for all life, from shipment to inspection, receipt and processing of A/S

#### DCP & ACP

- · Including the insulated transformer
- $\cdot$  DCP for battery connection : UPS for BMS, DC fuse Breaker, IMD

([[6]

• ACP for grid connection : Meter for KPX, Isolating transformer, SPD, Breaker





PLAONE-80KT3

PLAONE-90KT2 / 100KT2

Model	PLAONE-80KT3	PLAONE-90KT2	PLAONE-100KT2
Specifications			
Max. DC Power [kW]	84	95	105
Max. DC Voltage [V]	1000	1000	1000
Max. DC Current [A]	134	167	184
DC Voltage Range [Vdc]	630 ~ 850	570 ~ 1000	570 ~ 1000
Rated AC Power [kW]	80	90	100
AC Voltage Range [V]	380±10%	380±10%	380±10%
Max. AC Current [A]	134	151	167
General Data			
Max. Efficiency [%]	97.26	96.97	96.76
Cooling Principle	Forced Air Cooling	Forced Air Cooling	Forced Air Cooling
IP Level	IP54	IP54	IP54
Operating Temperature [°C]	-20℃ ~+50℃	-20℃ ~+50℃	-20℃ ~ +50℃
Dimensions (W/D/H) [mm]	1305 * 1247 * 1120	2260 * 1293 * 1120	2260 * 1293 * 1120
Weight [kg]	850	1300	1300

## **03 PV Inver** PLAVIX-Series

PLAVIX-Series, the leader in high-capacity inverters,

HD HYUNDAI PLASPO offers various solutions from IP54 to IP65. (For salt damage sites)

Model	H60	HPC-125HL-V1/V2/V3-OU	HPC-250HL-V1-OU
	MARANY	HYUNDAI	HYUNDAI
Input (DC)			
Max. DC Power [kW]	60	125	250
Max. DC Voltage [V]	1100 (Less than 1000 in serial-parallel)	1100 (Less than 1000 in serial-parallel)	1500
Max. DC Current [A]	125	260	277
MPPT Voltage Range [Vdc]	200 ~ 1100 (480 ~ 850)	200 ~ 1100 (480 ~ 870)	500 ~ 1500 (900 ~ 1200)
Max. DC Fuse (Option)	V1:25A, V2:30A, V3:20A	V1:25A, V2:30A, V3:20A	25A
No. of DC Inputs	3MPPT 9CH	9MPPT 18CH	12MPPT 24CH
Output (AC)			
Rated AC Power [kW]	60	125	250
AC Voltage Range [V]	380±10%	380±10%	800
Max. AC Current [A]	101	211	198.5
Frequency [Hz]	60	60	60
Current Harmonic [%]	Total<5 / Each<3	Total<5 / Each<3	Total<5 / Each<3
Power Factor	≥0.99	≥0.99	≥0.99
Grid Structure	3P4W	3P4W	3P3W
General Data			
Max. Efficiency [%]	98.54	98.50	98.80
Euro. Efficiency [%]	98.20	98.20	98.40
Cooling Principle	Forced Air Cooling	Forced Air Cooling	Forced Air Cooling
Operating Temperature [℃]	-25℃ ~ +60℃	-30℃ ~ +60℃	-30℃ ~ +60℃
Dimensions (W/D/H) [mm]	615 * 290 * 1005	1050 * 340 * 660	1100 * 400 * 690
Weight [kg]	69	86	120.5
IP Level	IP65	IP66	IP66
Communication		Ethernet (TCP/IP), CAN, RS-232/485	
Protection		OV, UV, OFR, OC, SC, etc.	
Standard	KS C 85	65 : 2016 / EMC EN61000-6-2 / EN61000	0-6-4

## PLAVIX-Series, 23 years of know-how in HD Hyundai Plaspo's PV inverters are constantly evolving.

Model	PLAVIX-1.0MH265	PLAVIX-2.0MH265	PLAVIX-3.0MH265
Input (DC)			
Max. DC Power [kW]	1050	2100	3150
Max. DC Voltage [V]	1500	1500	1500
Max. DC Current [A]	1180	2360	3540
MPPT Voltage Range [Vdc]	890 ~ 1300	890 ~ 1300	890 ~ 1300
Max. DC Fuse (Option) (Max. branch current)	4 (315A)	8 (315A)	12 (315A)
No. of DC MCCB Inputs (MPPT)	4 (1)	8 (2)	12 (3)
Output (AC)			
Rated AC Power [kW]	1000	2000	3000
AC Voltage Range [V]	600±10%	600±10%	600±10%
Max. AC Current [A]	1058	2117	3175
Frequency [Hz]	60	60	60
Current Harmonic [%]	Total<5 / Each<3	Total<5 / Each<3	Total<5 / Each<3
Power Factor	-0.90 (Capacitive) ~ +0.90 (Inductive) (< ±0.95 derating)		
Grid Structure	3P3W(IT,TT)	3P3W(IT,TT)	3P3W(IT,TT)
General Data			
Max. Efficiency [%]	>98	>98	>98
Euro. Efficiency [%]	>97	>97	>97
Cooling Principle	Forced Air Cooling	Forced Air Cooling	Forced Air Cooling
Operating Temperature [°C] [Derating over +40 °C (2%/1°C)]	-20℃ ~ +50℃, <2000m	-20℃ ~ +50℃, <2000m	-20℃ ~ +50℃, <2000m
Dimensions (W/D/H) [mm]	1000 * 1220 * 2250	2000 * 1220 * 2250	3000 * 1220 * 2250
Weight [kg]	950	1900	2850
IP Level	IP54 & IP65	IP54 & IP65	IP54 & IP65
Communication		Ethernet(TCP/IP), CAN, RS-232/485	
Protection	Overheat, FRT, Insu	llation monitoring, AC/DC surge, AC/I	DC over current, etc
Standard	KS C 8565 : 2021 / EMC EN61000-6-2 / EN61000-6-4		

## **04** Hydroelectric power supplies PLAGEN- Series

#### The PLAGEN-2.2M Rectifier,

suitable for large-scale hydrogen production, is a high-performance DC power supply based on high-efficiency, high-reliability IGBT rectifier technology.

- ✓ High power conversion efficiency (over 98%, rated load)
- Modular design for convenient maintenance
- ✓ Reliable and precise control
- Designed to meet international standards (CSA C22.2 NO.107.116, CSA SPE-1000:21)



Model	PLAGEN -2.2M Rectifier	
Rated DC Power [kW]	2200	
DC Voltage Range [V]	730 ~ 870	
Rated DC Voltage [V]	800	
DC Current Range [A]	0 ~ 2750	
Control Precision [%]	Voltage < ±1	
Regulation Range	Stepless at Constant Voltage	
Rated AC Power [kW]	2310	
Input AC Voltage / Range	3Phase 480 / +10%, -12%	
Rated AC Current [A]	2778	
Frequency [Hz]	60	
Auxiliary Supply	220VAC±10%, 60Hz, 3Phase (In line with mains)	
Total Harmonic Distortion [%]	Total<5 / Each<3	
Design Standards	CSA C22.2 NO.107.116, CSA SPE-1000:21 / EN 61000-6-2, EN 61000-6-4	
Noise Level	MAX 80dB	
Topology	3Phase AC/DC PWM Converter	
Power Factor	> 0.99 at rated output and nominal Input voltage	
Efficiency	Typical above 0.98 @ rated power	
Operating Temp [°C]	-30°C ~ +40°C (Higher on request upto 50°C)	
Cooling	Forced Air Cooling	
Humidity	Max. 95% RH non-condensing	
Communication	Ethernet(TCP/IP), CAN, RS-232/485	
Ripple Voltage	< 12 Vacrms (i.e. 1.5%) at full load	
Input Side Protection	Under Voltage, Over Voltage and surge protection, Overcurrent Protection	
Output Side Protection	Over Voltage, Under Voltage, Overload and short circuit protection	
AC & Control Cable Input	Left Enclosure Bottom or Side	
DC Output	Right Enclosure Bottom	
Dimensions (W/D/H) [mm]	4350 * 900 * 2210 (Indoor, IP21) / 4350 * 1120 * 2415 (Outdoor, IP54)	
Weight [kg]	3800 (Indoor) / 4000 (Outdoor)	
Finish Color	External : 7.5BG 6/1.5, Internal : 7.5BG 6/1.5	

## 05 Fuel cell Inverter PLAFEX- Series

Inverter PLAFEX-Series for SOFC generation is a PCS and PLC based fuel cell system control ECS for ship/power generation.

- ✓ Rated Efficiency 98% (1st Stage Conversion Topology)
- Lower THD (Application of harmonic compensation technology)
- ✓ FRT / reactive power control / active voltage control
- System system monitoring and self-diagnosis functions
- Fast, active Anti-Islanding and Smart Protection
- Parallel independent operation (with droop and load sharing technology)



Model	PLAFEX-60K	300K: PLAFEX-60K x 5Parallel
Nominal Input Power [W]	62000	310000
Operating Input Voltage Range [Vdc]	746 ~ 1200	746 ~ 1200
Max. Input Voltage [Vdc]	1250	1250
Nominal Input Voltage [Vdc]	880	880
Nominal Input Current [Vdc]	70	350
Max. Input Current [Vdc]	83	415
Rated Output Power [W]	60000	300000
Rated Output Voltage [Vac]	480	480
Rated Output Current [Aac]	72	361
Max. Output Current [Aac]	85	425
Power Factor Range	-0.85 ~ 0.85	-0.85 ~ 0.85
Output Frequency [Hz]	60	60
Current Harmonic [%]	Total < 3 / Each < 2	Total < 3 / Each < 2
Grid Structure	3P3W	3P3W
Temperature Range	-20℃ ~ +50℃	-20°C ~ +50°C
Cooling Method	Forced Air Cooling	Forced Air Cooling
Communication	Ethernet(TCP/IP), CAN, RS484	Ethernet(TCP/IP), CAN, RS484
Grid Support	FRT, Reactive Power Control, Active Voltage Control, etc.	FRT, Reactive Power Control, Active Voltage Control, etc.
Location	Indoors	Indoors
Dimensions (W/D/H) [mm]	240 * 590 * 740	1400 * 1800 * 2040
Weight [kg]	100	800

### Installation References











G-Project (300kW,2009)

GS-C (10kW,2010)

G-Growth (45kW,2012) Hyundai-C (30kW,2015)

S-Fuel Cell (210kW,2015)

## 06 LVRT & HVRT Test Container

HD HYUNDAI PLASPO's FRT test equipment, which was first developed in Korea, continues to develop HVRT test equipment in 2024.

HD HYUNDAI PLASPO's FRT Test Container generates low & high voltage at connection point where normally extra-high voltage (higher than 22.9kV) is applied. By doing this, our products will help you verify Grid Code suitability of your distributed generation facilities. (Wind Power, Solar Power, Fuel Cell, etc.)

- Electricity quality measurement
- Unbalanced voltage generation function
- Double dip, grounding generation function
- 3-phase, 2-phase, low & high voltage generation function
- FRT capability certification test at connection points with extra-high voltage (more than 22.9kV)



### Certification Case



Quebec in Canada





Backsu



Yeonggwang

### FRT Test Container

Model	HVRT		LVRT	
Capacity	12MVA	3MVA	5MVA	10MVA
Nominal Voltage	22.90kV / 36kV	22.9kW	22.9kW	36kV / 40.5kV
Frequency	50 / 60Hz	60Hz	60Hz	50 / 60Hz
Voltage Dip Level	0 ~ 130% Un	0 ~ 100% Un	0 ~ 100% Un	0 ~ 100% Un
Fault Type	3-Phase, 2-Phase Double dip	3-Phase, 2-Phase	3-Phase, 2-Phase	3-Phase, 2-Phase Double dip
Measurement System	AD : 16bit 16ch ~ 32ch	AD : 16bit 16ch ~ 32ch	AD : 16bit 16ch ~ 32ch	AD : 16bit 16ch ~ 32ch
Dimensions	High cubic 45ft	Standard 40ft	High cubic 40ft	High cubic 40ft
Operating Altitude	2000m	2000m	2000m	2000m
Ambient Temperature	-10℃ ~+40℃	-10℃ ~+40℃	-10℃ ~+40℃	-10℃ ~+40℃

# 07 EV Charger

### Electric vehicle chargers supplied by

HD Hyundai Plaspo ensure high compatibility, long life and low failure rate, HD Hyundai Plaspo leads the way in the electric vehicle era.

### Specification 200kW Modular Ultra-Fast Charger

Model	HDP-EPB-200K
Dimensions (W/D/H) [mm]	600 * 598 * 1867
Input [V]	380
Grid Structure	3P4W
Frequency [Hz]	60
Input [A]	319
Power [kW]	200
IP Level	IP54
Cable	DC Combo
Cable length [m]	6
Max. Current [A]	250
Max. Voltage [V]	1000



### Certifications Type Approval Certificate, OCPP, Test Report, KC Certification

Apple of the state     (1)	OCPP 1.6	KTC	
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**Achievement** Supplied and Installed Chargers for HD Hyundai Oilbank, The largest refinery company in Korea.



Installed gas stations

**40** site (Completed)



ns Target Installation Status 1,800 site (As of 2027)







13

## **08** UPS (Uninterruptible Power Supply)

HD Hyundai Plaspo provides UPS systems that ensure uninterrupted operation and protect sensitive equipment from potential damage. <u>We offer a variety of UPS types to meet various customer requirements.</u>

### UPS Product Supply Process



### Handling Items

AC UPS , DC UPS , BATTERY , DISTRIBUTION , MBP PANEL



## **19** Integrated O&M Service Platform PLANET

HD Hyundai Plaspo's integrated O&M service platform provides a powerful service that prevents failures in advance and to prevent failures in advance and provide powerful services to analyze failures and derive countermeasures in case of accidents.

- Efficient operational monitoring service with real-time fault notifications, data and statistics queries, and driving status monitoring anytime, anywhere.
- Predictive diagnosis and fault analysis service based on the specialized big data accumulated by HD Hyundai Plaspo over a long period.
- Lifecycle management service from product shipment to inspection, A/S reception, and processing.
- ✓ Integrated service for all HD Hyundai Plaspo products (PV, ESS, WIND, LPMS, String EMS, etc.).
- Renewable energy and battery integrated control platform service (LPMS, String-EMS).



HD Hyundai Plaspo's integrated O&M service platform, PLANET, born from expertise in operating over 500 sites. Experience enhanced performance and increased uptime.



· Network Diagnosis and Failure Trend Prediction

PLANET Integrated Control Screen





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