SP500HCG2 Integrated Solar Storage On/Off-Grid Cabinet

Product Specification Sheet

Version: V1.0

Date: September 05, 2025

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1.   Product Introduction

Integrates PCS, MPPT, EMS, PCM on/off-grid transfer switch, AC/DC distribution units, generator control, and lightning arresters internally. Supports connection of diesel generators, photovoltaics, and batteries. Primarily used in solar-storage-diesel microgrids, diesel-storage backup mining power supplies, etc., and supports parallel operation of multiple units. Application Scenarios: Solar-storage microgrids, backup power supplies, emergency power supplies, diesel-storage systems, construction sites, oil field extraction, field construction, etc.

1.1 Product Features

- Fast on/off-grid switching: 10ms.

- Multi-channel DC coupling, charging efficiency greater than 99.3%.

- Generator hybrid operation, grid-forming capability.

- Built-in anti-reverse power flow, self-consumption, peak shaving & valley filling.

- Supports multi-unit parallel connection.

- ALL-IN-ONE design, rapid deployment, simple on-site commissioning, plug-and-play.

2. Product Model And Dimensions

2.1.   Product Model

SP500HCG2

2.2. Naming Convention

This document applies to the model description of the SP**HC** series products.

No.	Code	Meaning
1	Company Name	SP: Sinoteng Microgrid
2	AC Rated Power	250: AC rated output power 250kW
3	DC Voltage Level	H: DC side input voltage within 680~900V
4	Protection Level	A:IP54

		C:IP20
5	Module Classification	G2: Hybrid Energy Storage Inverter
		PS: Power Conversion System
		DC: DC Converter
		PV: DC MPPT
		IV: Inverter

2.3. Product Appearance & Dimensions

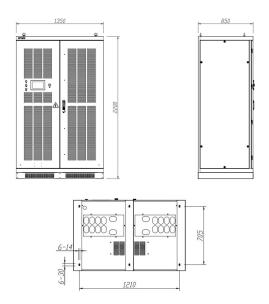### (1) Product Appearance

Figure 1

(2) Product Dimensions

Figure 2

3. Specifications

3.1. Parameters

Details	SP250HAG2
Battery Parameters	
Maximum Battery Voltage	950V
Minimum Battery Voltage	680V
Rated Battery Voltage Range	680V-900V
Maximum Battery Current	200A*4
PV Parameters	
Photovoltaic Power	120KW*4
Maximum PV Voltage	950V
Minimum PV Voltage	200V
Rated MPPT Voltage Range	600V-900V
Maximum Input Current	200A*4
AC Side (Grid-Tied)	
Rated Power	500kVA
Rated Current	724A
Rated Grid Voltage	400V/230V
Grid Voltage Range	-20%~15%
Grid Unbalance	125%
Grid Frequency Range	50Hz/47Hz~52Hz(60Hz/57Hz~62Hz)
Current THD	<3%（大于30%负载）

Power Factor	-1~1
AC Side (Off-Grid)	
Rated Output Power	500kVA
Maximum Output Power	550kVA
Rated Output Current	724A
Maximum Output Current	796.4A
Rated Voltage	400V/230V
Output Voltage THD	<2%(resistive load)
Unbalance	100%
Frequency Range	50/60Hz
Output Overload (Ie: Rated Output Current)	$I_e*1.1<I_{load}≤I_e*1.25$ 100s $I_e*1.25<I_{load}$ 300ms
System Parameters	
On/Off-Grid Switching Time	Active: 0ms; Passive: <10ms
Maximum Parallel Cabinets	3
EMS Functions	SOC Balancing, Peak Shaving & Valley Filling, Self-Consumption, Excess Electricity Feed-in, Cloud Platform, Anti-Reverse Power Flow, Generator Hybrid
Isolation Transformer	None (Supports adding transformer starting)
Bypass Function	800A
Protection Level	IP20
Dimensions (WHD)	W*H*D=1350*2200*850mm
Weight	≈850kg
Operating Temperature	-30~60℃(derating above 45°C)

Range	
Humidity Range	10-95%
Cooling Method	Air Cooling
Altitude	4000m (derating above 2000m)

4. Terminal Definitions
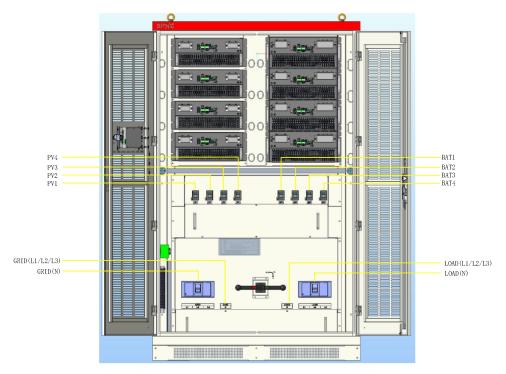
Figure 3

Terminal Definitions:

Name	Function	Remarks
PV1~PV2	MPPT PV Input Circuit Breaker	OT terminal (SC50-10), recommended cable: 50mm²
BAT1~BAT2	PCS Battery Input Circuit Breaker	OT terminal (SC50-10), recommended cable: 50mm²
GRID(L1\L2\L3\N）	PCS AC Input Circuit Breaker	OT terminal (OT240-12), recommended cable: 240mm² *2
LOAD(L1\L2\L3\N）	PCS AC Output Circuit	OT terminal (OT240-12), recommended cable:

	Breaker	240mm² *2
PE	Grounding Copper Bar	OT terminal (SC16-6), recommended cable:

| ⚠ CAUTION |
|---|
| • Use the M10 screws provided with the circuit breakers for PV and BAT input power terminals. Tightening torque: 25 N.m. |
| • Use the M12 screws provided with the circuit breakers for AC input and output power terminals. Tightening torque: 45 N.m. |
| • The module must be reliably grounded during operation. Poor grounding may cause electric shock hazard and module damage. Ground terminal tightening torque: 7 N.m. |
| • Follow the recommended torque values. Excessive torque may damage terminals; insufficient torque may cause poor contact. |
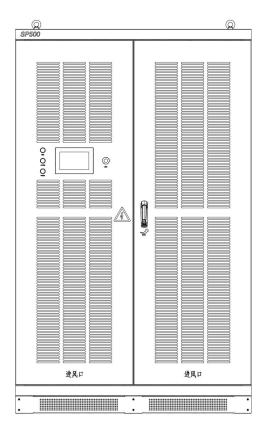
5. Cooling Requirements

5.1. Air Inlet/Outlet Method

The required air for the integrated unit is drawn in through the OB holes on the front door panel. The heated air is expelled through the MPPT and PCS from the outlet vents at the rear of the unit, as shown in Figure 4.
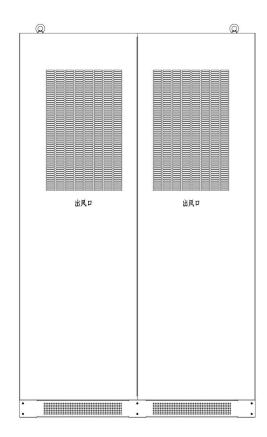
Figure 4

6. External EMS Dispatch Function

6.1. Microgrid EMS Introduction

The accompanying EMS series product, version for solar-storage-diesel microgrid EMS. The Microgrid EMS is a critical component for ensuring the efficient, reliable, and economical operation of a microgrid. It is responsible for dispatching and managing distributed generation resources, energy storage equipment, loads, and possible grid-tied, off-grid, and anti-reverse power flow operations, ensuring system stability and economical operation.

Figure 5

6.2. EMS Functions

● **Monitoring & Data Acquisition:** Real-time monitoring of energy flow within the microgrid, including generation, storage, PV, and load conditions. Collects and records key parameters such as voltage, current, power, frequency, etc. System diagnostics, cloud platform interface.

● **Control & Optimization:** Optimizes microgrid operation based on energy demand and supply conditions.

● **Protection & Safety:** Ensures safe operation of the microgrid, including overload protection, short-circuit protection, equipment fault detection, and response measures.

● **Energy Management:** Manages energy distribution within the microgrid, ensuring effective utilization of energy, reducing waste, and may include demand response and peak shaving strategies.

● **Economic Dispatch:** Performs economic dispatch based on electricity price changes and energy costs to minimize overall operating costs.

● **User Interaction:** Provides a user interface allowing users to view energy usage, set operating modes, and running parameters.

● **Grid-Tied & Islanded Operation:** Manages the microgrid's connection to and disconnection from the main grid.

● **Remote OTA:** Capable of remote diagnosis of EMS and inverter faults, remote software upgrades.

6.3. EMS Operating Modes

Economy Mode:

Suitable for scenarios with significant peak/off-peak electricity price differences.

This mode allows manual setting of charge/discharge time periods. For example, set low-tariff night hours as charging periods (requires enabling "Grid Charging" function in "Storage Control"). The system charges the battery at maximum power during these periods. Set high-tariff hours as discharge periods. The battery only discharges during discharge periods, saving electricity costs.

6.4. Other EMS Parameter Information

Refer to the EMS Specification Sheet for details.