C&I Energy Storage System Product Specification

Codi Energy., Ltd.

2025

Revision History

Name	C&I Energy Storage System Product Specification-50kW/ 112kWh		
Version	**Revision Content**	**Page**	**Revision Date**
A1.0	Initial Release		2025.5

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1.Scope of Application

This specification applies to the energy storage systems manufactured by Codi Energy., Ltd.

The purpose of this document is to provide an overview of the technical parameters, dimensions, installation, and transportation requirements of the energy storage system. The scope of this manual is limited to this product only.

Buyers are required to confirm the latest product status with RPT prior to placing orders.

The English version of the specifications is provided for reference only; the Chinese version shall prevail in case of any discrepancies.

This specification may be updated periodically due to product version upgrades or other reasons, without prior notice.

2. Product Description

Codi Energy., Ltd. Provides a 50 kW /112 kWh PV-StorageIntegrated System, primarily applied in commercial and industrial sites, data centers,campus energy storage, farms, and other scenarios. This PV-storage energy storagesystem integrates a PV-storage inverter, lithium iron phosphate (LiFePO) batteries, airconditioning, fire protection system, and EMS management system, and is configured inan outdoor cabinet. The system is designed to deliver high operational efficiency, lowenergy consumption, and long service life.

3. Product Composition

The 50 kW / 112 kWh PV-Storage Integrated System consists of one 50 kW three-phase grid-tied and off-grid inverter, seven battery groups of 51.2 V 314 Ah modules, a main control cabinet, a 3 kW air conditioning unit, and a fire protection module. The system's AC side is connected to the grid, while the DC side is internally connected to the batteries.

4. Product Features

5.1. EMS OverviewDiesel Hybrid Mode: Supports diesel hybrid operation, providing flexible energy combinations and improving overall energy utilization efficiency.

Photovoltaic Function: Built-in MPPT module, supporting up to two 38 kW PV inputs.

Three-Phase Independent Grid Control Technology: Enables independent control of each phase, optimizing power distribution and enhancing system flexibility and efficiency.

Seamless Switching: Built-in STS allows grid-connected and off-grid seamless switching (<10 ms).

Grid Compatibility: Equipped with comprehensive high/low voltage ride-through, anti-islanding protection, and black-start functions.

Parallel Operation: AC side supports up to 15 units in parallel for grid-connected or off-grid operation; DC side supports multiple units in parallel.

Grid-Connected and Off-Grid Expansion: In both modes, the AC side supports expansion with up to 3 units.

Flexible Application Scenarios: Suitable for small commercial and industrial sites, small island microgrids, farms, villas, and other scenarios to meet diverse user requirements.5. EMS Functions

The 50 kW / 112 kWh system is equipped with a PV-Diesel Microgrid EMS. The microgrid EMS is a key component for ensuring efficient, reliable, and economical operation of the microgrid. It is responsible for dispatching and managing distributed generation resources, energy storage devices, loads, and handling grid-connected, off-grid, and anti-reverse flow operations, ensuring system stability and cost-effective operation.

5.2. EMS Function Description

Monitoring and Data Acquisition: Real-time monitoring of energy flows within the microgrid, including generation, storage, PV, and load conditions. Collects and records key parameters such as voltage, current, power, and frequency, supports system diagnostics, and interfaces with cloud platforms.

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

Protection and 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 to ensure efficient utilization, reduce waste, and may include demand response and peak-valley smoothing strategies.

Economic Dispatch: Performs economic dispatch based on electricity price fluctuations and energy costs to minimize overall operational expenses.

User Interaction: Provides a user interface allowing users to monitor energy usage, set operating modes, and adjust operating parameters.

Grid-Connected and Islanded Operation: Manages grid connection and disconnection operations of the microgrid.

5.3. EMS Operating Modes

5.3.1. Self-Consumption

Applicable for areas with high electricity prices and low or no FIT subsidies. Excess PV generation is stored in the battery, and when PV output is insufficient or during nighttime, the battery discharges to supply the load. This increases the self-consumption rate of the PV system and household energy self-sufficiency, reducing electricity costs.

When PV irradiation is sufficient, PV output is 35 kW, load consumption is 10 kW, and the battery charges with 25 kW.

When PV irradiation decreases, PV output is 10 kW, load consumption is 20 kW, and the battery discharges 10 kW to supply the load.

5.3.2. Economic Mode

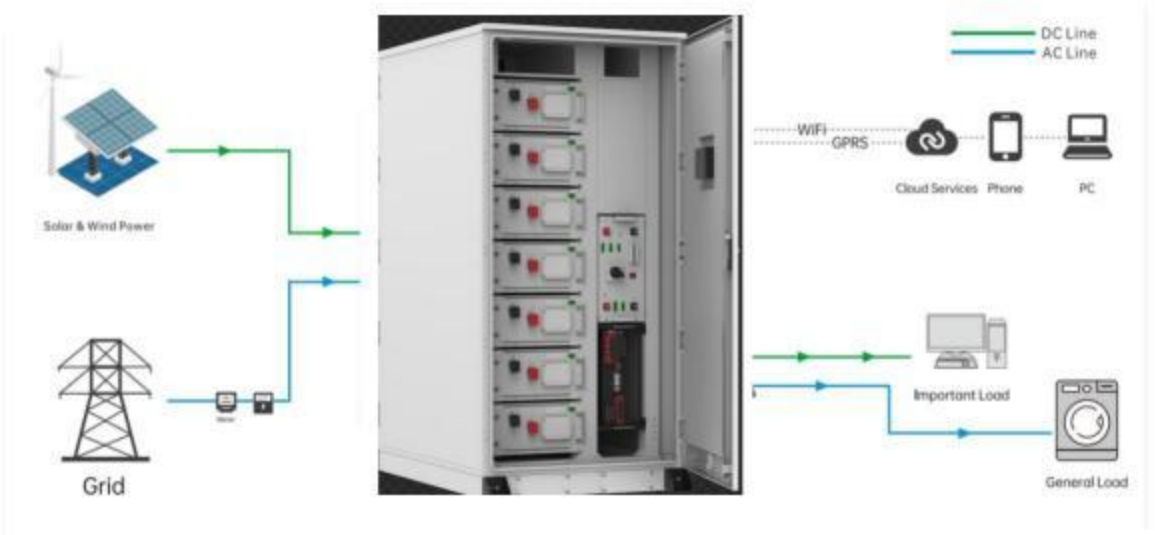
Applicable in scenarios with significant peak-valley electricity price differences. In this mode, charge and discharge periods are set manually. For example, the low electricity price period at night is set as the charging period, during which the system charges the battery at maximum power. The “Grid Charging” function in Energy Storage Control must be enabled. High electricity price periods are set as the discharging period, during which the battery is allowed to discharge, helping to reduce electricity costs.

5.3.3. Grid-Feed Priority

Applicable for grid-connected scenarios in full feed-in mode. In this mode, PV generation is maximized for grid export. During the day, if PV generation exceeds the

inverter's maximum output capacity, excess energy is stored in the battery. When PV generation is below the inverter's maximum output, the battery discharges to ensure the inverter delivers maximum energy to the grid.

6. System Schematic Diagram



7. Product Specifications

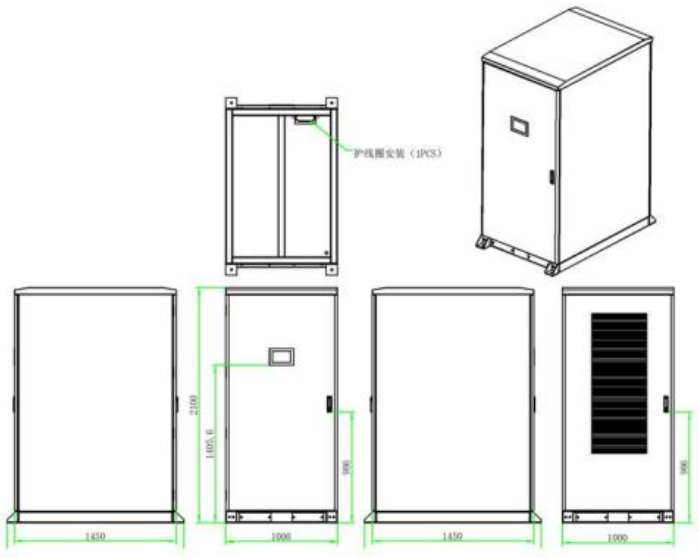
Basic Parameters	RPCI-50kW/112kWh-HVC5
Battery System Parameters	
Module Model	51.2V
Number of Modules	7
Module Dimensions	442*750*230mm
System Voltage	358.4V
Battery Capacity	314Ah
Energy	112kWh
Maximum Charging Current	150A

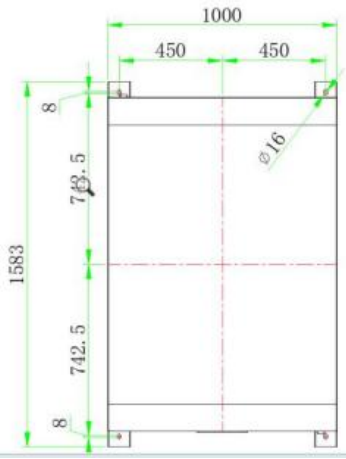
Maximum Discharging Current	150A
Charging Voltage	386.4V
Cut-off Voltage	313.6V
50 kW Inverter Specifications	
Battery Parameters	
Maximum Battery Voltage	850V
Minimum Battery Voltage	200V
Rated Voltage Range	350V-850V
Maximum Charge/Discharge Current	150A
Photovoltaic Parameters	
Maximum Power	38.4kW+38.4kW
Maximum PV Voltage	850V
PV Start-up Voltage	250V
MPPT Voltage Range	200V-800V
Maximum PV Current	64A + 64A
AC Parameters	
Nominal Power	50KVA
Nominal Current	73A
AC Voltage	400V/230V
AC Voltage Range	-20%~20%
Frequency	50Hz/47Hz~52Hz
	60Hz/57Hz~62Hz

Power Factor (PF)	-0.8~0.8
Off-grid Parameters	
Nominal Power	50KVA
Maximum Output Power	55KVA
Nominal Current	73A
Maximum Output Current	80A
AC Voltage	400V/230V
Voltage Harmonics	<3%(resistive load)
Unbalance	100%
Frequency	50/60HZ
Output Overload	Ie*1.1<Iload≤Ie*1.25 100s Ie*1.25<Iload≤Ie*1.4 300ms Ie*1.4<Iload≤Ie*1.5 100ms Ie*1.5<Iload 30ms
System Parameters	
Communication Interface	EMS:RS485 battery:CAN or RS485
DIDO	DI*2 DO*2
Efficiency	97%
Weight	45kg
Dimension	440*670*200mm
IP Rating	IP20
Operating Temperature Range	-30~60℃
Humidity	5~95%RH

Cooling Method	FAN
PCS Certificates	CE，IEC62019，IEC62477，IEC6100，EN50549
Cabinets	
Cooling Method	Air Conditioning Cooling
Dimension	1000*1450*2100mm
Inverter Installation Method	Built-in Cabinet
Protection Rating	IP54
Weight	Approx. 1250 kg

8. Product Structure





9. Internal Layout Diagram

10. Precautions

1. Ensure all equipment switches are OFF during installation.

2. Ensure all equipment is disconnected during wiring operations.

3. Battery packs must be maintained by qualified personnel only. Unauthorized disassembly is strictly prohibited. During operation or maintenance, never damage or wear out battery connections to avoid hazards.

4. Before using battery modules, verify that positive and negative terminals are correctly and securely connected, and that the battery pack enclosure is properly grounded. Battery disassembly must not be performed without experienced personnel

present. Even with professional personnel, disassembly must be done carefully, with at least two persons present to ensure safety.

5.During charging, ensure that the charger cooling vents are unobstructed. Do not discharge the battery while it is charging.

6.When using battery modules, do not exceed the specified operating conditions, as this may cause insufficient capacity, reduced lifespan, or other abnormal conditions. Do not expose battery modules to direct sunlight for prolonged periods. Do not step on or immerse battery modules in water. When not in use, store them in a cool, dry place, preferably at partial charge.

7. Before connecting cables, ensure that the cable markings match the actual installation. Only then proceed with the connection.

8.For high-voltage or AC operations, use dedicated tools only. Do not carry ordinary or non-specialized tools during these operations.

9. Installation of power equipment must comply with local safety regulations. Personnel performing the installation must hold the required qualifications. During operation, remove watches, bracelets, rings, or other conductive items.

10. In humid environments, ensure proper waterproofing to prevent water from entering the battery or other equipment.