



HYBRID DIESEL ENERGY STORAGE SYSTEM

Powering solutions™

Web www.senmarck.com

PROFESSIONAL ENERGY STORAGE SYSTEM INTEGRATOR



»» About SENMARCK

SENMARCK ENERGY company is high-tech company based in Shenzhen, China. SENMARCK was awarded ISO9001:2015, ISO45001:2018 and ISO14001:2015 certificates. It specializes in design and production of solar energy storage systems for residential and commercial applications.

SENMARCK is the first company which invented hybrid diesel energy storage system. The hybrid system can be compatible with variety of diesel generators and manage diesel generators work efficiency. Besides it can work with heavy duty equipment like tower cranes, drilling machines, concrete mixers etc. The unique system combines solar, lithium battery and diesel generators which help save huge energy costs for industrial and commercial energy users, like construction sites, quarries, oilfields, mining sites, factories etc.



OUR VISION

Promote the application of renewable energy in the world.



OUR MISSION

To offer well-designed, high quality manufactured residential and industrial energy storage products and solutions.



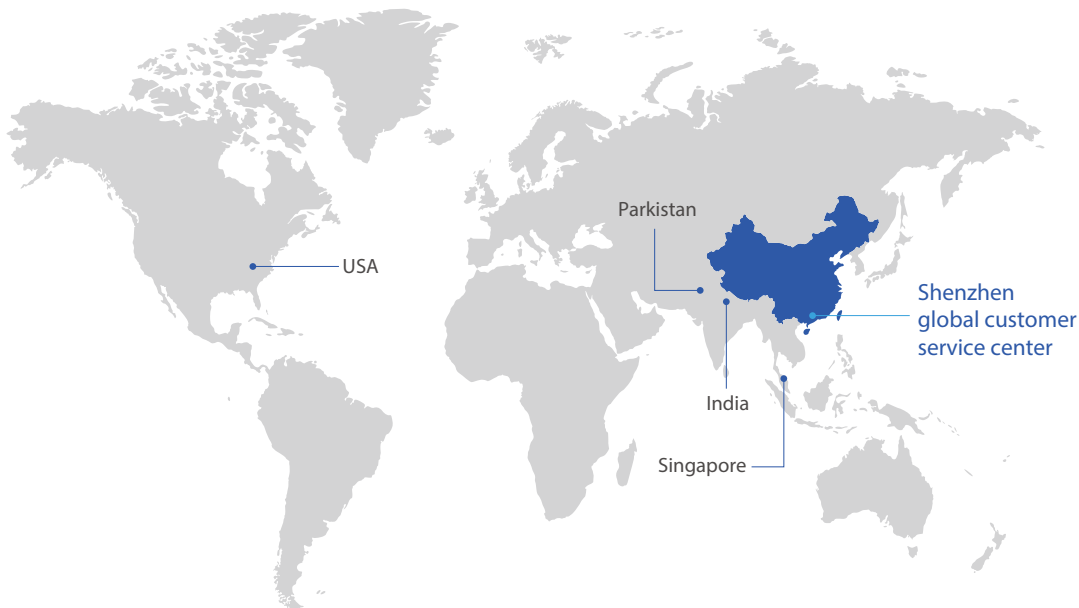
OUR VALUES

Customer-centric, teamwork, quality, collaboration, innovation, integrity.

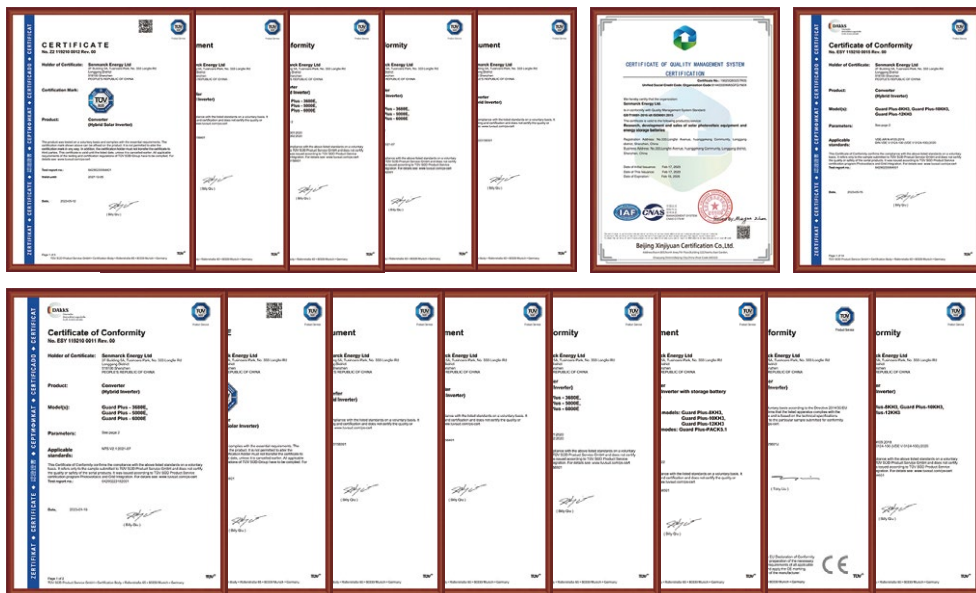


»» Office and service center globally

SENMARCK ENERGY commits to offering the best customers services and the best quality energy systems for our global customers. Our vision is to promote the application of renewable energy in the world.



»» Our awards



125 certifications and awards

PowerMore-PHE330/600 Diesel Generator Included



»» Overview

SENMARCK ENERGY invented the first hybrid diesel generator energy storage system in the market. It combines diesel energy, solar and lithium battery in one integrated container. The smart hybrid system manages the market diesel generators efficiency, save up to 40% fuel costs.

»» Features



Diesel Generator Included



Peak Power Boost



Solar Energy Combination



MicroGrid / Off-grid / On-Grid



Adapt Engineering Motor Load



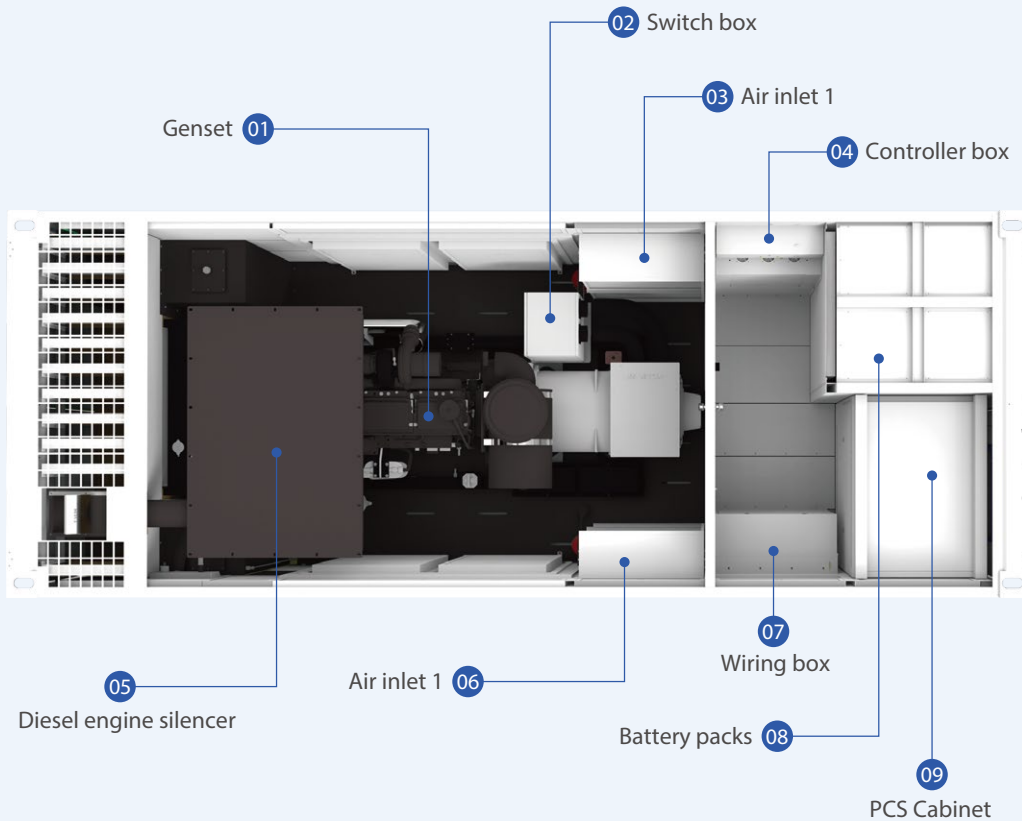
Active BESS Warning Systems



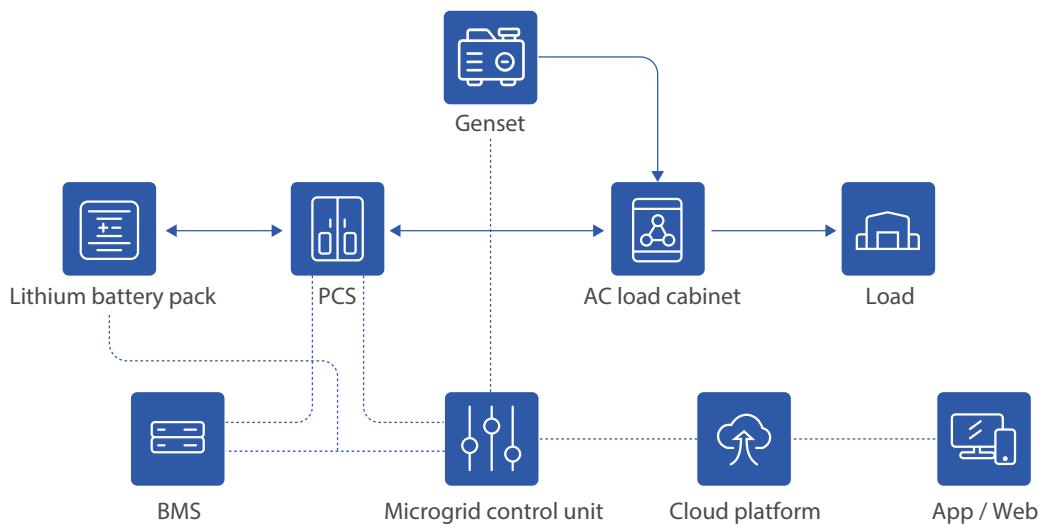
Reliable Structural Design



Fast Deployment, Plug & Play



»» System Diagram



» Datasheet

⦿ PowerMore-PHE600

(358kW Diesel Generator + 250kW/140kWh ESS)

No.	Equipments	Specifications	Unit	Quantity
1	358KW diesel generator	400VAC/358KW	1	1
2	Lithium battery	665.6V/140kWh	1	1
3	Power conversion system	250KW	1	1
4	Air conditioner	Cooling capacity 3000W; heating capacity 2000W	1	1
5	20 feet container	IP54 Protection, outdoor design	1	1
6	Smart microgrid control cabinet	Include EMS	1	1
7	General parameters	Fire protection, fans, video surveillance control, lighting, etc.	1	1

Main Equipments

⦿ Lithium Battery storage system specifications

1	Rated energy	140kWh@25 °C
2	Rated capacity	210Ah
3	Rated voltage	665.6V
4	Voltage range	582.4V-817.6V
5	Rated charge/discharge	1C/1C
6	Charge and discharge efficiency	>95%
7	Depth of discharge (%)	100%
8	Lithium cells	416pcs
9	Battery modules	13pcs
10	Configuration	(2P16S)*13S
11	Cell capacity	105Ah
	Cell voltage	3.2V
	Cell voltage range	2.5V-3.65V
	Life Cycle	100%DOD, ≥6000 cycles
12	Module rated capacity	210Ah
	Module rated voltage	51.2V
	Module voltage range	41.6V-58.4V
	Cells per module	32pcs
	Module dimension(W/H/D)mm	447*630*340
	Pack dimension(W/H/D)mm	1050*700*2260
13	Pack weight	1270±50kg
	Operating temperature range(°C)	Charging: 0 °C ~55 °C Discharging: -20 °C ~ 55 °C
14	Storage temperature	-30 °C ~ 60 °C
	Communication with PCS	Dry contact/CAN
	Communication with EMS	RS485, ETH

◎PCS-250K specifications

AC(Grid-connected)	
Apparent power	275kVA
Rated power	250kW
Rated voltage	400V
Voltage range	340V - 460V
Rated frequency	50Hz/60Hz
Frequency range	±2.5Hz
Rated current	360A
THDI	≤3%
Power factor	-1 ~ +1
Isolation transformer	Yes

AC(Off-grid)	
Rated voltage	400V
Voltage range	±10%
Rated frequency	50Hz/60Hz
THDU	≤3% linear

DC(Battery)	
Battery voltage range	600V ~ 900V
Max. Current	458A
Max. power	275kW
Voltage accuracy	≤1%
Current accuracy	≤1% (rms)

General Information	
System efficiency	≥97%
Isolation method	Power frequency isolation
Cooling	Forced-air
Noise emission	70dB
Operating temperature	-20 °C ~ 50 °C
Protection degree	IP20
Maximum altitude	5000m(derate over 3000m)
Relative humidity	0~95%
Dimension(W*H*D)	1100mm×2000mm×820mm
Weight	1300kg
Transfer between grid and diesel generator	Diesel generator power≤20ms, grid power≤100ms
110% overcurrent capability	Long time
120% overcurrent capability	30 minutes

Communication	
Display	Touch screen
Host computer communication method	Modbus TCP/IP
Communication Interface	Network port, RS485, CAN

SENMARCK PowerMore™-PDE hybrid diesel energy storage series

are specially designed to work with existing diesel generators and improve fuel efficiency.

Compatible with photovoltaic and grid, maximize the green energy adoption.



PowerMore-PDE65

65kW/69.1kWh/138.2kWh

PowerMore-PDE130

130kW/69.1kWh/138.2kWh/276.4kWh

PowerMore-PDE250

250kW/138.2kWh/276.4kWh/552.8kWh

»» Features

Diesel Generator Compatibility

Stabilize load curves, control the DG to reduce fuel burn and emissions and save genset costs. Communicate with a generator and automatically switch it on / off at pre-programmed loads.

Peak Power Boost

Supplement power from the on-board inverter to meet high load peaks utilizing battery power.

Solar Energy Combination

Be connected without infrastructure changes to solar sources

MicroGrid/Off-grid/On-Grid

Supply off-grid energy supply for construction sites, mining sites, remote residential estates and factories. Genset peak shaving and grid power peak shaving.

Adapt Engineering Motor Load

Tower crane, Static pile driver, crusher, air compressor, concrete mixer can be loaded easily.

Active BESS Warning Systems

Sound and light alarm system, fire extinguishing system, video surveillance system, SMS alarm system, etc.

Reliable Structural Design

IP54 outdoor design, adopt container or vehicle-mounted structure, firm and solid, suitable for frequent lifting and transportation, plug and play with rapid deployment.



»» PowerMore-PDE250 Internal Structural Design



EMS PCS Battery



AC Power Cabinet EMS

Core Technology – Customized PCS

SENMARCK PowerMore™ Series include customized bi-directional Converters(PCS)















»» Features

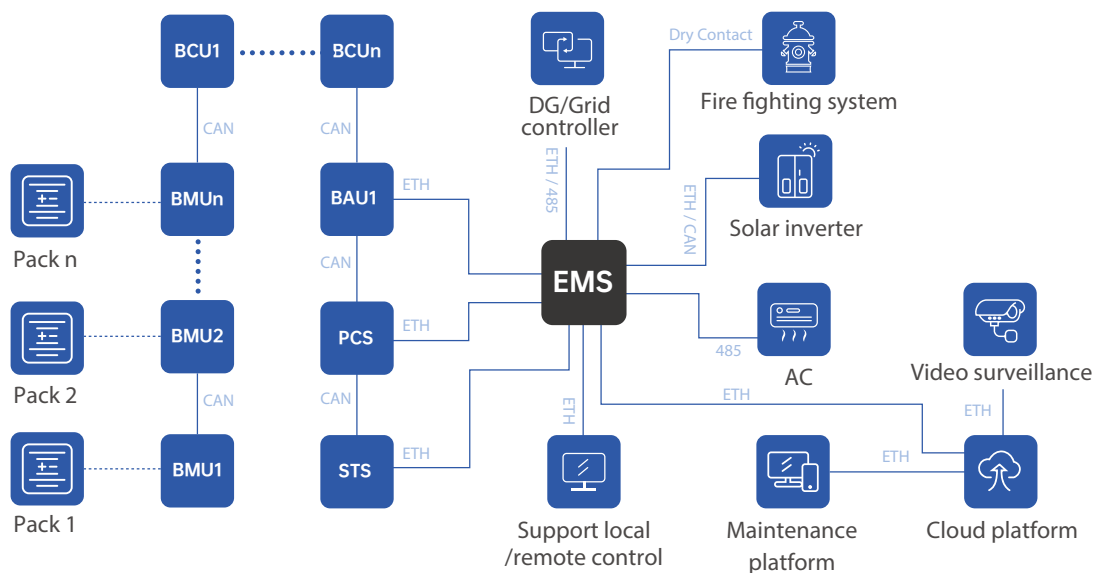
- ◆ Bi-directional with full power (from 65kW to 500kW)
- ◆ Special design to satisfy inductive loads and industrial equipments loads. Super overload capacity.
- ◆ 3-phase, 100 % unbalanced load acceptance
- ◆ **Operation Modes**
 - Combination with diesel generator
 - Island system
 - Grid-connected system
- ◆ **Multifunction**
Genset peak shaving, optimize genset power efficiency, grid power peak shaving, solar energy storage...

»» Products Applications

SENMARCK ENERGY designed the first hybrid diesel generator energy storage system in the market.

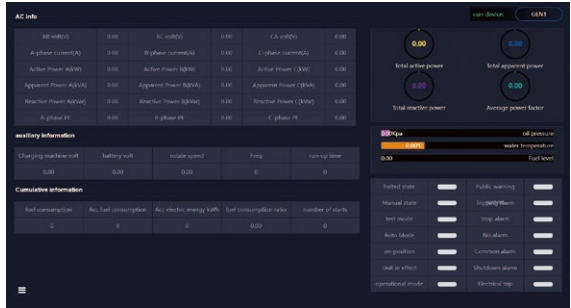
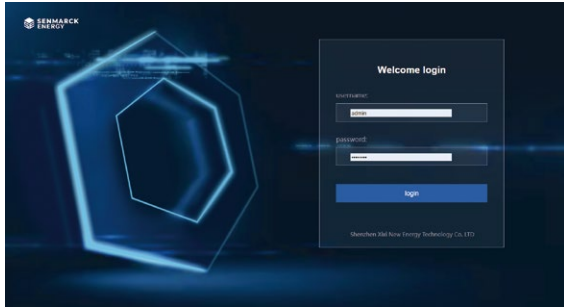
 Power backup	 Highland Region power backup	 Offshore platform	 Bridge project
 Highway	 Railway	 Tunnel	 Screw pile driver
 Multi-axis drilling rig	 Static pressure pile driver	 Impact drill	 Others

»» System Diagram



SENMARCK EMS3100 is equivalent to the "smart brain" of the energy storage system. It integrates battery packs, special bidirectional converters, battery management system and other energy components into a complete EMS system.

»» Online Access to your PowerMore ESS



- ◆ Login through mobile phone, tablet, or computer
- ◆ Monitoring and control
 - Observe the functions and state of the system
 - Change the settings
 - Real time historic data review
- ◆ Energy dispatching
 - integrate diesel energy storage and solar energy storage
 - Scheduling algorithm, panoramic monitoring
 - Remote control, simple operation and easy to use

⊙ PowerMore-PDE65 Datasheet

	65kW/69.1kWh	65kW/138.2kWh
DC(Battery)		
Cell	LiFePO4 3.2V/50Ah	LiFePO4 3.2V/50Ah
Rated energy	69.1kWh	130kWh
Voltage range	600~900V	600~900V
Battery configuration	216S2P	208S4P
BMS Interface	RS485/Ethernet	RS485/Ethernet
AC(Off-grid)		
Rated voltage	400Vac	
Rated frequency	50Hz	
Voltage range	400Vac (±10%)	
Frequency range	±3Hz	
THDI	<3%	
Inverter DC component	<0.5%	
Power factor	-1~1	
Isolation method	Power frequency transformer	
Voltage adjustable range	±10%	
THDU	3% linear load	
System parameters		
Diesel generator/grid input capacity	30kW~120kW	
Operating temperature	-20~50 C	
Storage temperature	-30~55 C	
Relative humidity	0~95% (
Altitude	5000m(derate over 3000m)	
Noise emission	65dB	
Protection degree	IP54	
External communication interface	Ethernet, RS485	
Dimension (L*W*H)	800*800*2200mm	
Weight	1200kg	

⊙ PowerMore-PDE130 (130kW / 229.3kWh)

Lithium battery storage system specifications

1	Rated energy	229.3kWh@25 °C			
2	Rated capacity	280Ah		12	Module rated capacity
3	Rated voltage	819.2V			280Ah
4	Voltage range	640V-934.4V			Module rated voltage
5	Rated charge/discharge	0.5C/0.5C			38.4V
6	Charge and discharge efficiency	≥90%			Module voltage range
7	Depth of discharge	90%			40V-58.4V
8	Lithium cells	256pcs			Cells per module
9	Battery modules	16pcs			16pcs
10	Configuration	(1P16S)*16S		13	Cluster rated capacity
11	Cell capacity	280Ah			280Ah
	Cell voltage	3.2V			Cluster rated voltage
	Cell voltage range	2.5V-3.65V			768V
	Life Cycle	100%DOD, ≥6000 cycles			Voltage range
					640V-934.4V
					Modules quantity
					16pcs
				14	Operating temperature range (°C)
					Charging: 0 °C ~55 °C
					Discharging: -20 °C ~ 55 °C
					Storage temperature
					-30 °C ~ 60 °C
				15	Communication with PCS
					Dry contact/CAN
					Communication with EMS
					RS485、ETH

⊙ PCS-130K specifications

AC(Grid-connected)		General Information	
Apparent power	150kVA	System efficiency	≥97.3%
Rated power	130kW	Isolation method	Power frequency isolation
Rated voltage	400V	Cooling	Forced-air
Voltage range	340V - 460V	Noise emission	≤65dB
Rated frequency	50Hz/60Hz	Operating temperature	-20 °C ~50 °C
Frequency range	±2.5Hz	Protection degree	IP20
Rated current	187A	Maximum altitude	5000m(derate over 3000m)
THDI	≤3%	Relative humidity	0~95%
Power factor	-1 ~ +1	Dimension(W*H*D)	750mm*820mm*2000mm
Isolation transformer	Yes	Weight	700kg
AC(Off-grid)		Transfer between grid and diesel generator	Diesel generator power≤20ms grid power≤100ms
Rated voltage	400V	110% overcurrent capability	Long time
Voltage range	± 10%	Communication	
Rated frequency	50Hz/60Hz	Display	Touch screen
THDU	≤3% linear	Host computer communication method	Modbus TCP/IP
DC(Battery)		Communication Interface	Network port, RS485, CAN
Battery voltage range	600 ~ 950V		
Max. Current	240A		
Max. power	145kW		
Voltage accuracy	≤1%		
Current accuracy	≤1% (rms)		

⊙ PowerMore-PDE130, 130kW / 229.3kWh System Configuration

DC(Battery)	
Rated energy	229.3 kWh
Rated Voltage	819.2V
Voltage range	640V-934.4V

◎ PowerMore-PDE250, 250kW/138.2kWh

Lithium battery storage system specifications

1	Rated energy	140kWh
2	Rated capacity	210
3	Rated voltage	665.6V
4	Voltage range	582.4V-759.2V
5	Rated charge/discharge	1C/1C
6	Charge and discharge efficiency	> 95%
7	Depth of discharge	100%
8	Lithium cells	416pcs
9	Battery modules	13
10	Configuration	(2P16S)*13S
11	Cell capacity	105Ah
	Cell voltage	3.2V
	Cell voltage range	2.5V-3.65V
	Life Cycle	100%DOD, ≥6000 cycles

12	Module rated capacity	210Ah
	Module rated voltage	51.2V
	Module voltage range	41.6V-58.4V
13	Cells per module	32pcs
	Cluster rated capacity	210Ah
	Cluster rated voltage	665.6V
14	Voltage range	582.4V-817.6V
	Modules quantity	13pcs
	Operating temperature range (°C)	Charging: 0 °C ~55 °C Discharging: -20 °C ~ 55 °C
15	Storage temperature	-30 °C ~60 °C
	Communication with PCS	Dry contact/CAN
	Communication with EMS	RS485、ETH

◎ PCS-250K specifications

AC(Grid-connected)	
Apparent power	275kVA
Rated power	250kW
Rated voltage	400V
Voltage range	± 15%
Rated frequency	50Hz/60Hz
Frequency range	±2.5Hz
Rated current	360A
THDI	≤3%
Power factor	-1~+1
Isolation transformer	Yes
AC(Off-grid)	
Rated voltage	400V
Voltage range	± 10%
Rated frequency	50Hz/60Hz
THDU	≤3% linear
DC(Battery)	
Battery voltage range	600~900V
Max. Current	458A
Max. power	275kW
Voltage accuracy	≤1%
Current accuracy	≤1% (rms)

General Information	
System efficiency	≥97.3%
Isolation method	Power frequency isolation
Cooling	Forced-air
Noise emission	70dB
Operating temperature	-20 °C ~50 °C
Protection degree	IP20
Maximum altitude	5000m(derate over 3000m)
Relative humidity	0~95%
Dimension(W*H*D)	1100mm×2000mm×820mm
Weight	1800kg
Transfer between grid and diesel generator	Diesel generator power≤20ms, grid power≤100ms
110% overcurrent capability	Long time
Communication	
Display	Touch screen
Host computer communication method	Modbus TCP/IP
Communication Interface	Network port, RS485, CAN

◎ PowerMore-PDE250, 250kW/138.2kWh System Configuration

DC(Battery)	
Rated energy	140kWh
Rated Voltage	665.6V
Voltage range	582.4V-748V
AC(Off-grid)	
Rated Power	250kW
Rated voltage	400V
Voltage range	400±10%(
Frequency range	50±1Hz
Power factor	-1~+1
Maximum output capacity	
Battery power	140kW(1 hour)

System parameters	
AC connection	3/N/PE
Container dimension(W*H*D)	2500mm×2438mm×2681mm
Weight	4500kg
Protection degree	IP54
Noise emission	< 65B
Operating temperature	-20 °C ~50 °C
Storage temperature	-40 °C ~65 °C
Altitude	5000m(derate over 3000m)
Relative humidity	5%~95%
Communication interface	Ethernet, RS485, CAN2.0, 4G

» Projects



Singapore Construction Site

Location: Singapore
Capacity: 250kW/138.2kWh
Inverter: PCS250K



Road Construction Site

Location: Guangzhou
Capacity: 600kW/138.2kWh
Inverter: PCS250K
Diesel generator: 360kW



Tunnel Construction Site

Location: Shenzhen
Capacity: 250kW/138.2kWh
Inverter: PCS250K



Bridge Construction Site

Location: Huizhou
Capacity: 250kW/276.4kWh
Inverter: PCS250K



Highway Construction Site

Location: Guangzhou
Capacity: 330kW/69.1kWh
Inverter: PCS130K
Diesel generator: 200kW



Buildings Construction Site

Location: Hangzhou
Capacity: 1000kW/1105.6kWh
Inverter: PCS500K



Highway Construction Site

Location: Guangzhou
Capacity: 330kW/69.1kWh
Inverter: PCS130K
Diesel generator: 200kW



Road Construction Site

Location: Singapore
Capacity: 250kW/276.4kWh
Inverter: PCS250K
Diesel generator: 400kW



Bridge Construction Site

Location: Shenzhen
Capacity: 600kW/276.4kWh
Inverter: PCS250K



Road Construction Site

Location: Nanjing
Capacity: 250kW/276.4kWh
Inverter: PCS250K



Bridge Construction Site

Location: Guangzhou
Capacity: 610kW/276.4kWh
Inverter: PCS250K
Diesel generator: 360kW



Road Construction Site

Location: Guangzhou
Capacity: 250kW/276.4kWh
Inverter: PCS250K



Road Construction Site

Location: Jiangxi
Capacity: 610kW/276.4kWh
Inverter: PCS250K
Diesel generator: 360kW

INNOVATIVE RENEWABLE ENERGY SOLUTION PROVIDER



SENMARCK ENERGY

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