

RENLE

ENERGY STORAGE SYSTEM

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RENLE'S ENERGY STORAGE SYSTEM SOLUTION

MAKES ENERGY CONSUMPTION MORE ECONOMIC, SMARTER AND SAFER

RENLE's energy storage system is R&D for applications such as power grid side, power generation side, user's side and microgrid energy storage. RENLE, depending on its production capability as an ODM factory and battery technology, and upstream materials, developed lithium iron phosphate battery core with longer life and lower cost. RENLE can supply integrated solutions and products for applications from battery packs, battery clusters to container energy storage system and large-medium-small optical storage systems. The product adopts modularization design, third degree BMS protection, high efficiency PCS/optical storage all-in-one machine and smart EMS management. Products can be flexibly configured. Application scope includes power grid, industry and commerce, data center, backup power, domestic energy storage and low-speed electric vehicle etc.



Core Superiorities Of Energy Storage System



Container type energy storage product

- Modularization of product design
- Integration of system structure
- Diversification of system expansion and upgrade



Energy storage solution

- Frequency modulation and peak shaving of energy storage
- Smart microgrid
- Backup power supply system
- Domestic energy storage system



Perfect project delivery management

- Customized energy storage battery with optimal features/controllable cost
- A team with practical experience of development for many years

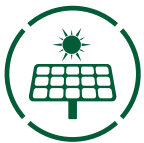


Operation maintenance

- Rapid response
- Real time big data
- Remote control



Application of energy storage system



Power generation side

- Smooth and intermittent energy
- Peak shaving and frequency modulation
- Raise of new energy absorption



Power grid side

- Auxiliary service
- Delay of capacity increase



User' s side

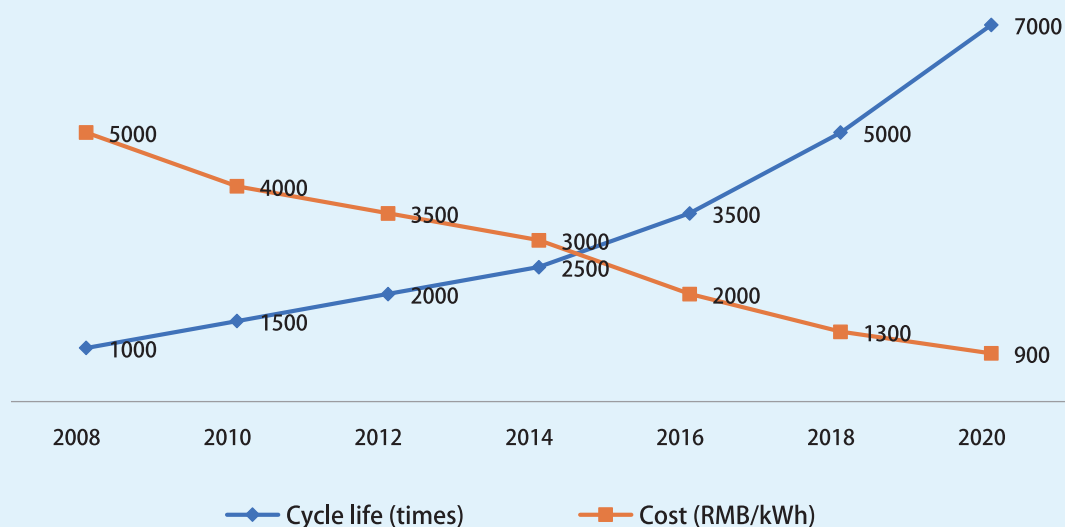
- Peak shaving and valley filling
- Restraint of load and required amount
- Increase of power supply reliability and energy quality



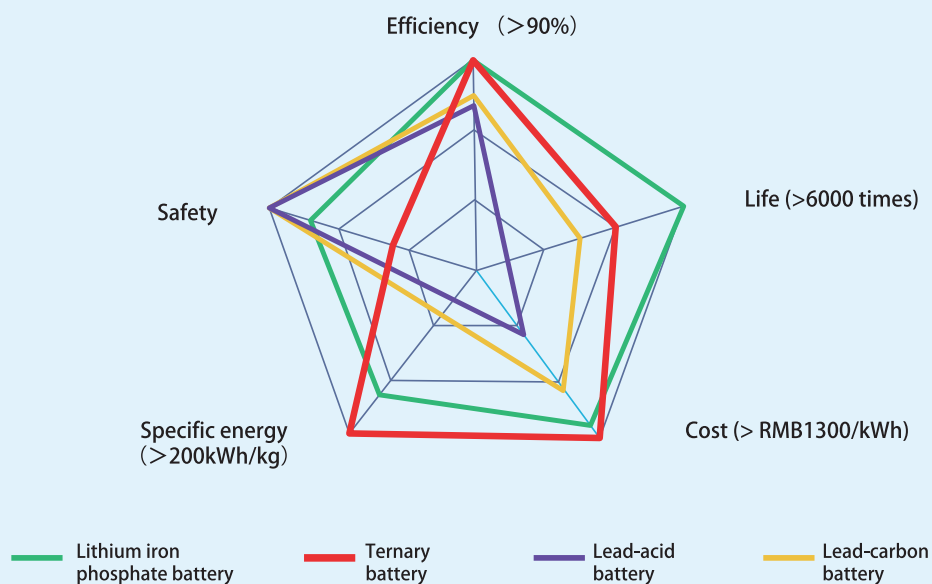
Island, off-grid energy storage

- Microgrid
- Energy storage of areas in shortage of electricity

Development tendency of lithium iron phosphate battery



Tendency of cycle life-cost of lithium iron phosphate battery



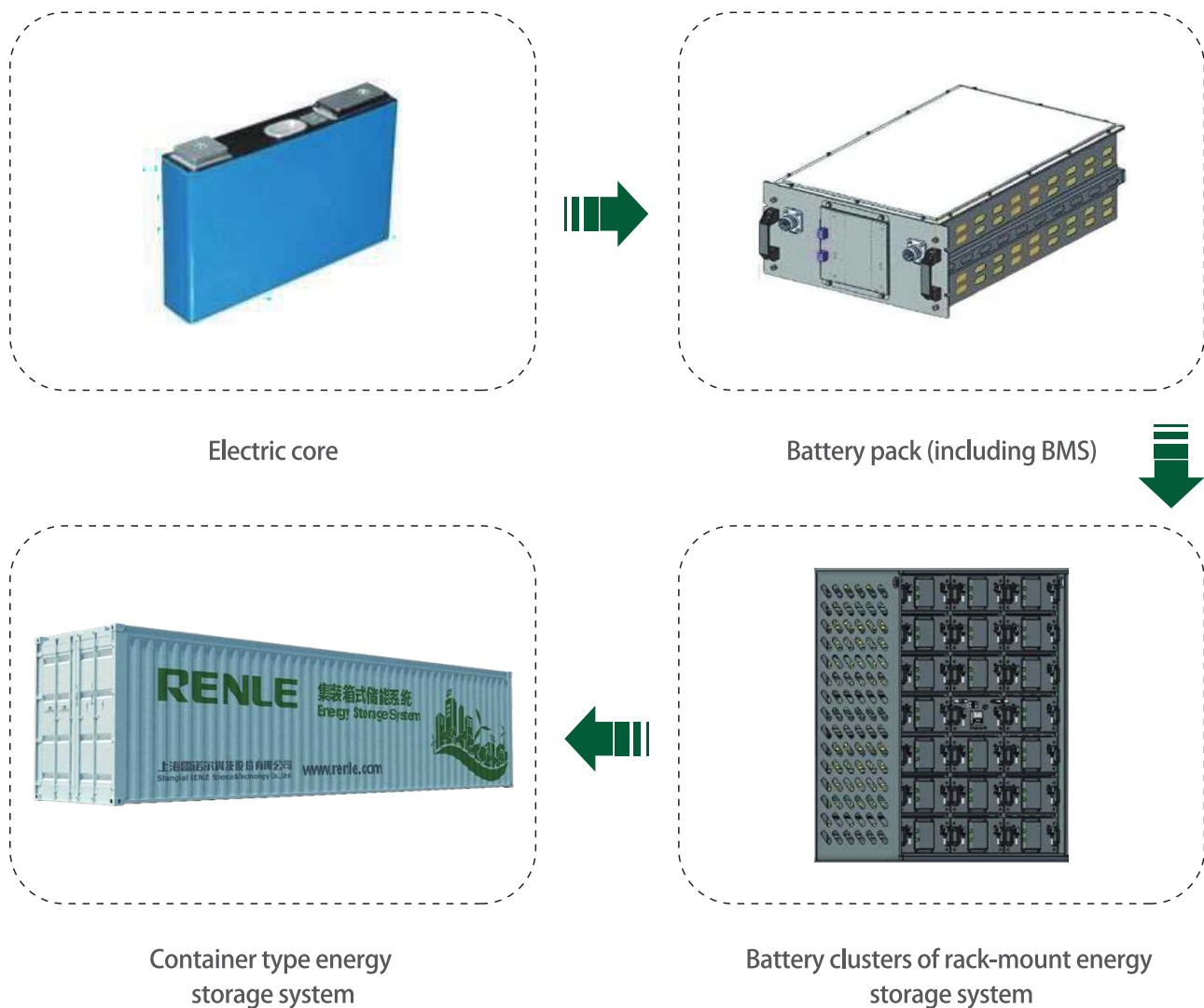
Radar map of lithium iron phosphate battery and other main streams

Compared with batteries of other systems, RENLE's lithium iron phosphate battery fully considers aspects such as safety, life and cost and has more superiorities.

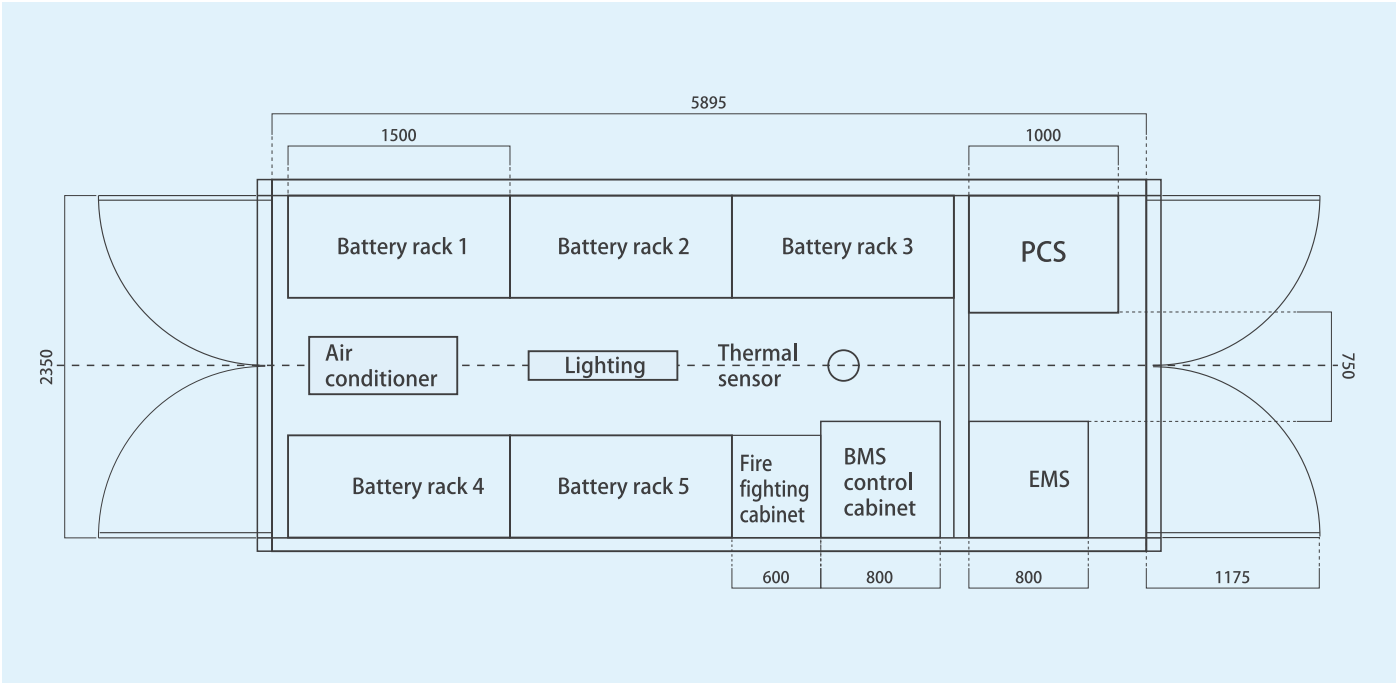
Features of energy storage system

- ◎ Modularization structure allows flexible combination of degree systems of different voltage within 1000V/different capacity and convenient maintenance;
- ◎ Design of third degree battery management system provides highest reliability;
- ◎ Customized lithium iron phosphate battery offers high safety and long cycle life. Service life can be longer than 10 years;
- ◎ Small volume and light weight makes transportation easy. Rack-mount and container type structure offers flexible arrangement and allows rapid application at different sites;
- ◎ RENLE' s battery passed certifications such as TUV, CE, UN38.3 and GB/T36276-2018 etc.

Structure of large container type energy storage system

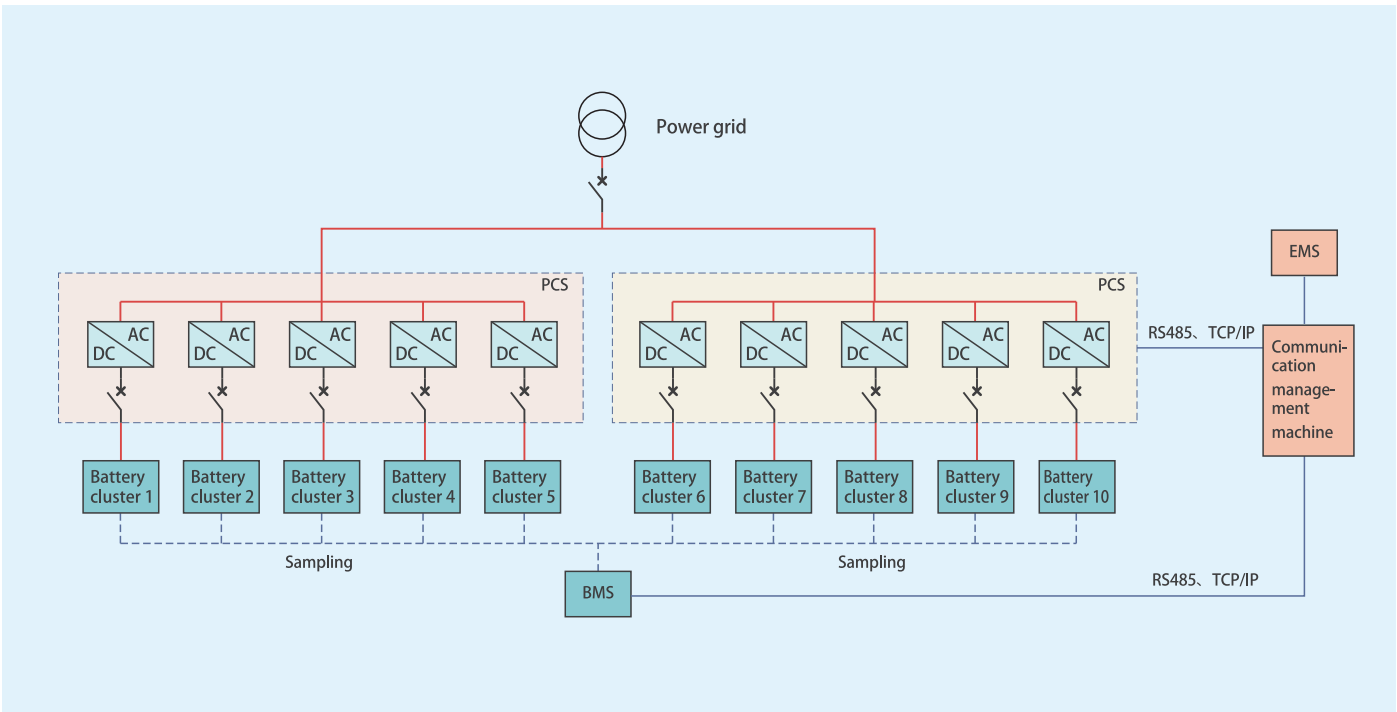


Arrangement diagram of container type energy storage system

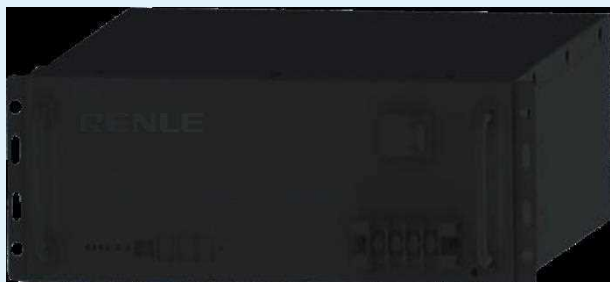


Container type energy storage system includes lighting, fire protection, environment control, electric distribution, security and monitoring etc. Container type energy storage system of different sizes can be customized according the requirement of customers with different inner arrangement.

Topological diagram of energy storage system



Battery pack



LFPS-48 series pack

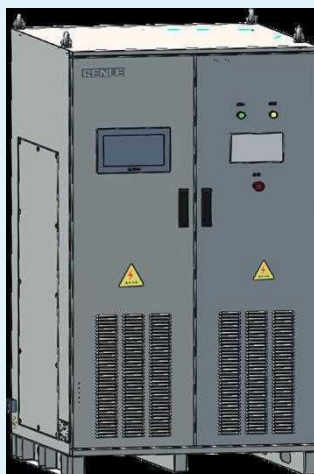


11.904kWh standard pack

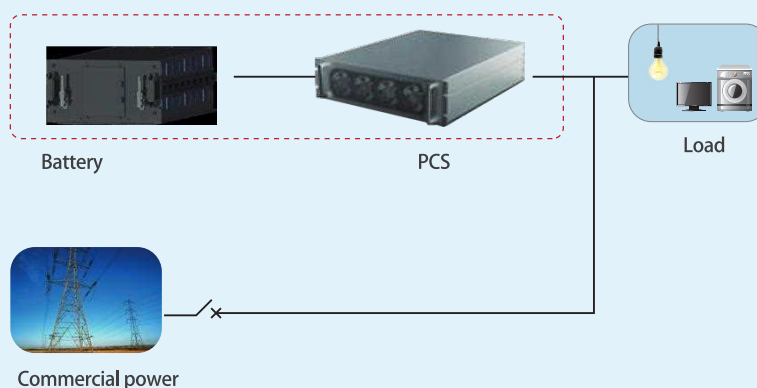
Electric parameters					
Model	LFPS-4850	LFPS-48100	LFPS-48155	76.8V155Ah	38.4V310Ah
Battery type	Lithium iron phosphate	Lithium iron phosphate	Lithium iron phosphate	Lithium iron phosphate	Lithium iron phosphate
Rated capacity	50Ah	100Ah	155Ah	155Ah	310Ah
Quantity of electricity	2.56kWh	5.12kWh	7.936kWh	11.904kWh	11.904kWh
Nominal voltage	51.2V	51.2V	51.2V	76.8V	38.4V
Limited charging voltage	58.4±0.3V	58.4±0.3V	58.4±0.3V	87.6±0.3V	43.8±0.3V
Floating charging voltage	55.2±0.3V	55.2±0.3V	55.2±0.3V	82.8±0.3V	41.4±0.3V
Max. charging current	50A	100A	155A	155A	310A
Standard charging current	25A	50A	77.5A	77.5A	155A
Max. charging current	25A	50A	77.5A	77.5A	155A
Standard discharging current	75A	150A	232.5A	232.5A	465A
Max. discharging current	100A	200A	310A	310A	620A
Pulse discharging current	43.2V	43.2V	43.2V	64.8V	32.4V
Discharging end voltage	40.0V	40.0V	40.0V	60V	30V
Discharging cut-off voltage	≤3%	≤3%	≤3%	≤3%	≤3%
Structure & environment					
Standard dimensions (W x D x H)	482±3mm	482±3mm	483±3mm	420±3mm	420±3mm
	470±3mm	470±3mm	467±3mm	651±3mm	651±3mm
	200±2mm	200±2mm	222±2mm	210±2mm	210±2mm
Weight	30±2Kg	56±2Kg	63±2Kg	90Kg	90Kg
Charging temperature	0 ~ 45℃	0 ~ 45℃	0 ~ 45℃	0 ~ 45℃	0 ~ 45℃
Discharging temperature	-20~ 55℃	-20~ 55℃	-20~ 55℃	-20~ 55℃	-20~ 55℃
Normal operation temperature	5℃ ~ 45℃	5℃ ~ 45℃	5℃ ~ 45℃	5℃ ~ 45℃	5℃ ~ 45℃
Storage condition	5~ 35℃	5~ 35℃	5~ 35℃	5~ 35℃	5~ 35℃
SOC	30%	30%	30%	30%	30%

Energy storage system

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Working diagram



System parameter

Model	RNES-C-119R04	RNES-C-226R176
Output power/system energy	35kW/119.04kWh	70kW/226.18kWh
Battery type	Lithium iron phosphate	
Protection degree	IP21/IP65 (container)	
Guarantee	3 years for product, 10 years for performance	

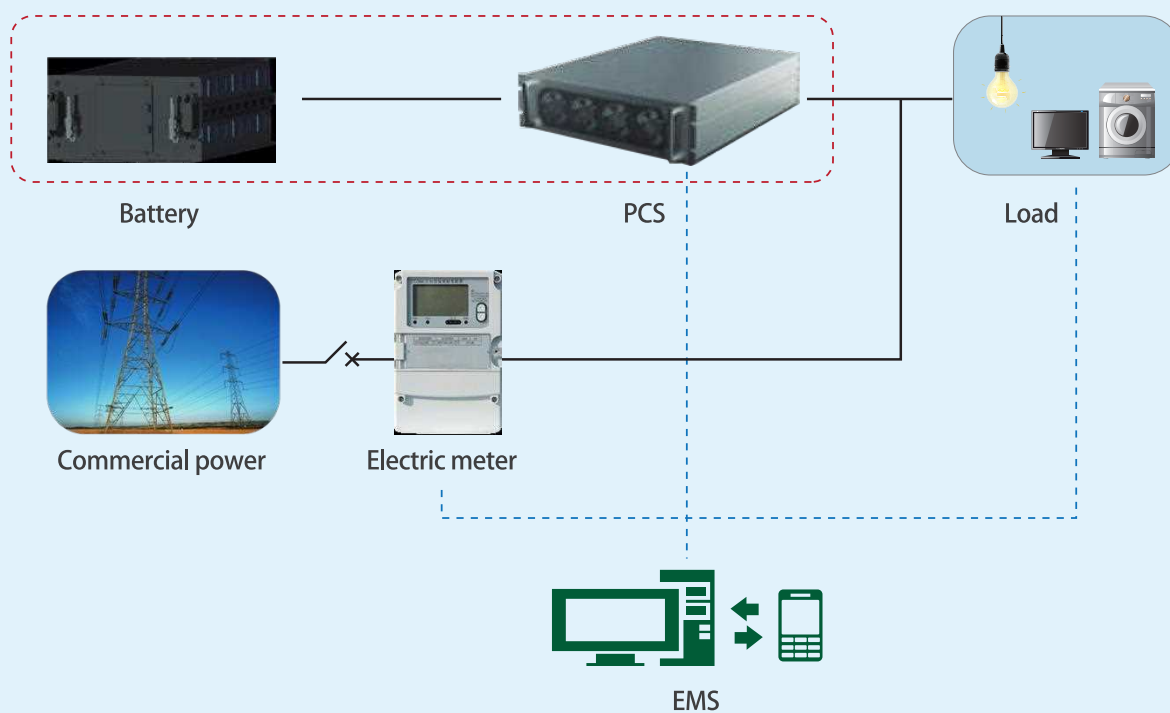
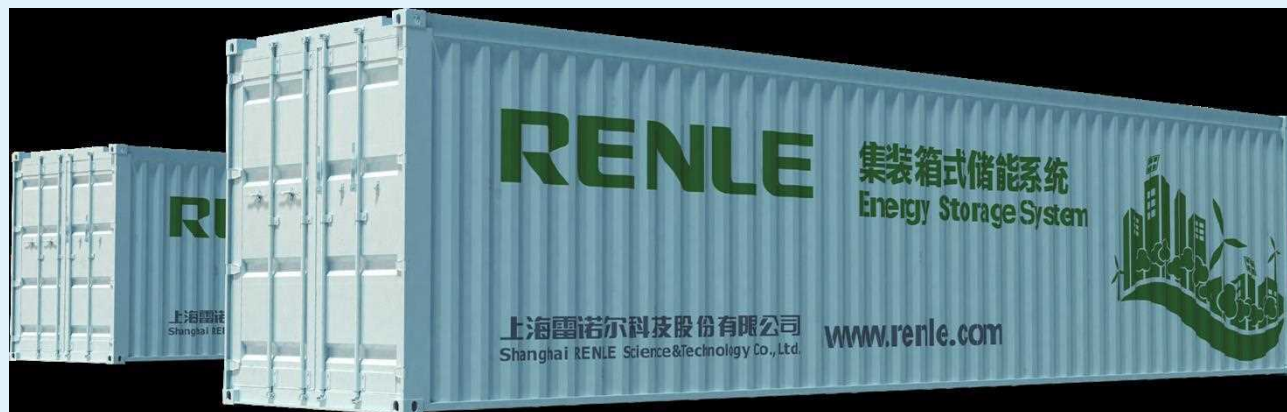
Inverter parameter

Max. DC current	55A	110A	Off-grid output voltage range	AC380V ± 15%
Voltage range	DC600~900V		Rated output frequency	50/60Hz
DC channel number	1	1/2	Backup battery	UPS (STS needed)
Charging management	3-section charging		Operation temperature	-25~55℃
Max. AC current	53A	106A	Dimensions(W x D x H)	435 × 135 × 600
Max. charging/discharging power	35kW	70kW	Weight	35kg 36kg
Number of phase	3 phases, 3 lines		Communication interface	RS485、CAN、LAN、REPO
Rated output voltage	AC380V		Communication protocol	CAN / ModBus TCP / ModBus RTU
Grid voltage range	AC380V ± 15%			

Technical parameter of battery & BMS

Electric core model	3.2V155Ah	
Battery capacity	119.04kWh	226.18kWh
Weight	1200kg	2600kg
Dimensions (W x D x H)	1500 × 750 × 1500	1900 × 750 × 2000
Cycle number	≥ 5000 cycles, or 5 years	
Electric core connection method in pack	1P24S	2P12S
Pack connection method in battery cluster	1P10S	1P19S

Container type energy storage system



Working diagram

System parameter		
Model	RNES-C-20	RNES-C-40
Output power/system energy	350kW/1.1904MWh	350kW/1.1904MWh
Battery type	Lithium iron phosphate	
Protection degree	IP65	
Cooling method	Battery room, air conditioner electric room, smart air cooling	
Inverter parameter		
Max. DC current	550A	1870A
Voltage range	DC600~900V	
DC channel number	5	13
Charging management	3-section charging	
Max. AC current	530A	1378A
Max. charging/discharging power	350kW	910kW
Number of phase	3 phases, 5 lines	
Rated output voltage	AC380V/AC400V	
Grid voltage range	± 15%	
Off-grid output voltage range	± 15%	
Rated output frequency	50/60Hz	
Backup battery	UPS (STS needed)	
Operation temperature	-25~55℃	
Dimensions(W x D x H)	1000 × 800 × 2000	1200 × 800 × 2000
Communication interface	RS485、CAN、LAN、REPO	
Communication protocol	CAN、ModBus TCP、ModBus RTU	
Weight	800kg	1600kg
Technical parameter of battery & BMS		
Electric core model	3.2V155Ah	1.1904MWh
Battery capacity	1.1904MWh	14t
Weight	14t	6000 × 2352 × 2385
Dimensions (W x D x H)	6000 × 2352 × 2385	
Cycle number	≥ 5000 cycles, or 5 years	
Electric core connection method in pack	2P12S	
Pack connection method in battery cluster	1P20S	

Note: Number of battery packs can be adjusted according to the requirement of project. The system can be customized according to the requirements of the customer.