The products and their description in this catalog are subject to upgrade with the renovation of the products. Please refer constantly to RENLE's official website: www.renle.com. Shanghai RENLE Science & Technology Co, Ltd reserves the right of final interpretation.





Shanghai RENLE Science & Technology Co., Ltd No.3988 Chengbei Road, Jiading District, Shanghai, 201807, P. R. China

Tel: +86-21-3953 8058, 5996 6666

Fax: +86-21-3953 8129 E-mail: info@renle.eu

RENLE Europe GmbH Wendemuthstraße 5, 22041 Hamburg

Telefon: 040 - 25 08 415 Fax: 040 - 50 09 70 43

http://www.renle.eu

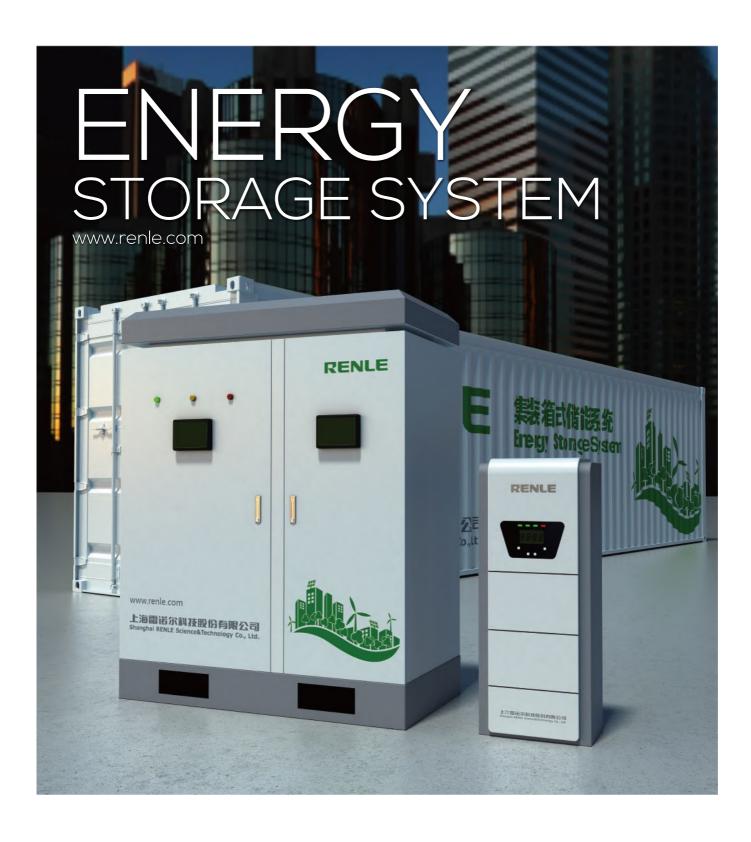
National toll free service hotline: +86 800-8200-785

September, 2019



WeChat Public Service Account

RENLE



Professional manufacturer of Smart Grid • New Energy • Electric Drive

RENLE Science&Technology Co., Ltd.





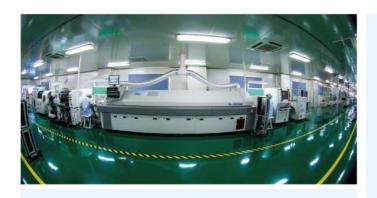
Shanghai RENLE Science & Technology Co., Ltd is a designer and product provider of energy saving system for intelligent electric industry, as well as an integrator of solutions f or control system. Renle' s products include LV motor soft starter, LV frequency inverter (VFD or AC drive), intelligent electric equipment, new energy electric equipment and complete sets of LV/HV power transmission and distribution equipment etc. The products are widely used in different kinds of industries and fields, such as electric power industry, metallurgical industry, petroleum and petrochemical industries, mines, chemical industry, construction industry, construction material industry, municipal engineering, military industry, light industry, textile, printing and dyeing, papermaking and pharmaceutical industries etc.

Renle's products are well exported to many countries and areas in the world.

Renle's products have been used as parts of complete national key projects, such as Expo 2010 Shanghai China, 2008 Beijing Olympic Games, Yangshan Deepwater Port Project of Shanghai International Shipping Center, Shanghai Pudong Airport, Shanghai Hongqiao Airport, the Three Gorges Project, Gansu Satellite Launching Center, South-to-North Water Diversion Project, West-to-East Natural Gas Transmission Project, China National Petroleum Corp., SINOPEC, Double Coin Type Group Ltd., and Shandong Linglong Tire Co., Ltd. etc. The products receive unanimous appraise from the customers for excellent quality and perfect after-sales service.







In China, RENLE is a pioneer who has firstly passed the certification of ISO9001 Quality Management System, ISO 14001 Environment System, OHSAS 18001 Occupational Health and Safety Management System, CE, TUV, GOST and national CCC etc. RENLE has been continuously introducing internationally advanced production and test equipment, and has established laboratories and provided R&D experiment base to domestic universities and colleges. Approved by National Human Resources and Social Security Bureau, RENLE has established a post-doctoral workstation. This shows that RENLE cooperates with universities for setting up platforms for teaching and study. This raises the independent innovation ability and R&D ability of the enterprise.

For many years Renle has been striving for and devoted to production modernization, administration collectivization, production specialization and technical leading. Renle has achieved

many honors: Key High-tech Enterprise of National Torch Program, High and New Tech Enterprise, National Enterprise of Credit, State-level Key New product, Shanghai Innovative Enterprises, Shanghai Enterprise Certifying Technology Center, Shanghai Renowned Brand, Shanghai Famous Brand Product, Shanghai Key New Product, Shanghai Renowned and High Quality Product, Post-doctoral workstation and Smart Grid R&D centers.

Renle will continually develop energy saving, high efficient, precise and humanized products, as well as help customers realize economic transformation and industrial upgrading with unique industrial control technology, advanced and applicable innovation products and profoundly integrated solution. In addition, Renle will speed up its pace of internationalization, satisfy the customers with quality and try to become a world renowned professional supplier of smart electric equipment!





RENLE' S ENGERGY STORAGE SYSTEM SOLUTION

MAKES ENGERY 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 configurated. Application scope includes power grid, industry and commerce, data center, backup power, domestic energy storage and low-speed electric vehicle etc.



RENLE

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
- Operation of the property o



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

- O 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



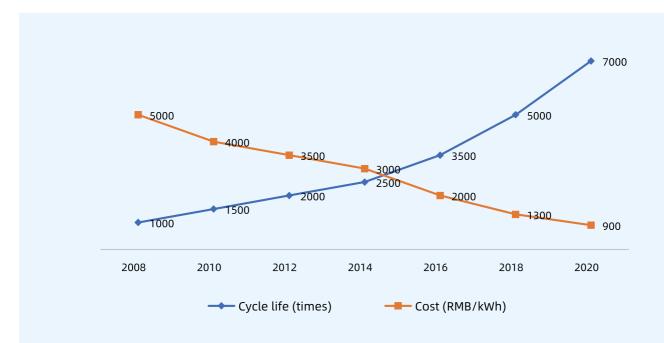


Island, off-grid energy storage

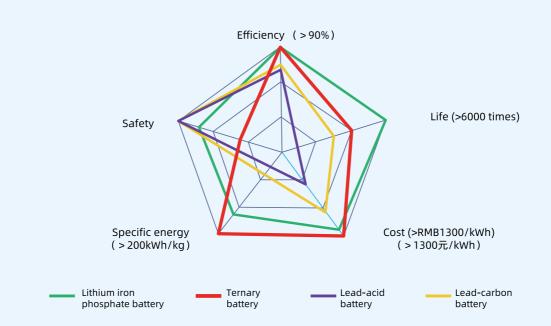
- ⊚Microgrid
- © Energy storage of areas in shortage of electricity



Development tendency of lithium iron phosphate battery



Tendency of cycle life-cost of lithium iron phosphate battery



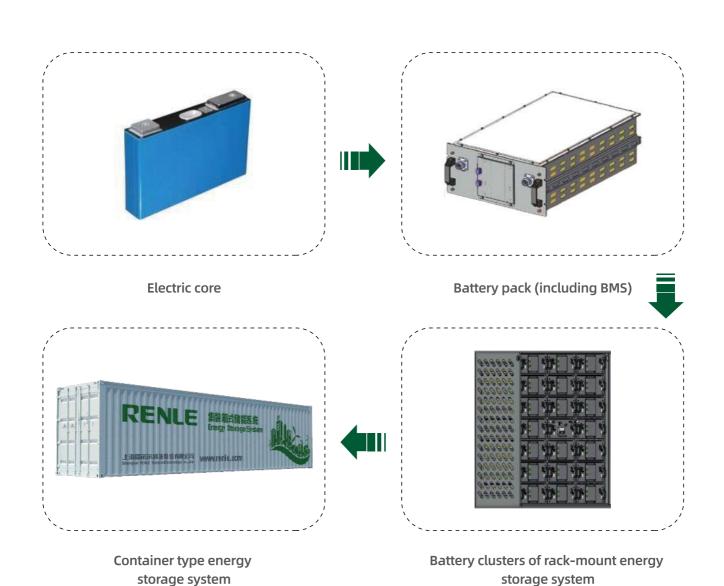
Radar map of lithium iron phosphate battery and other main streams

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

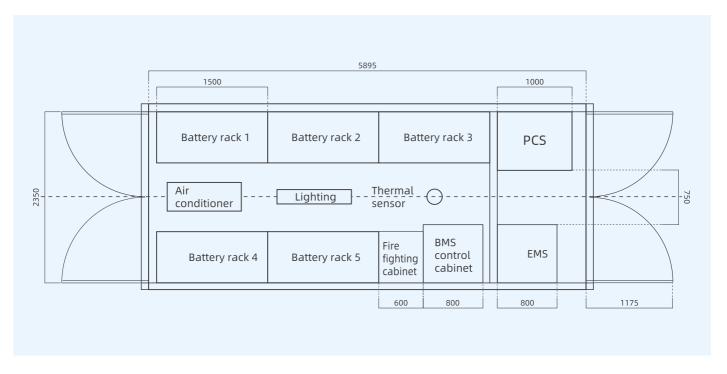
- Modularization structure allows flexible combination of degree systems of different voltage within 1000V/different capacity and convenient maintenance;
- © Design of third degree battery management system provides highest reliability;
- © Customized lithium iron phosphate battery offers high safety 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



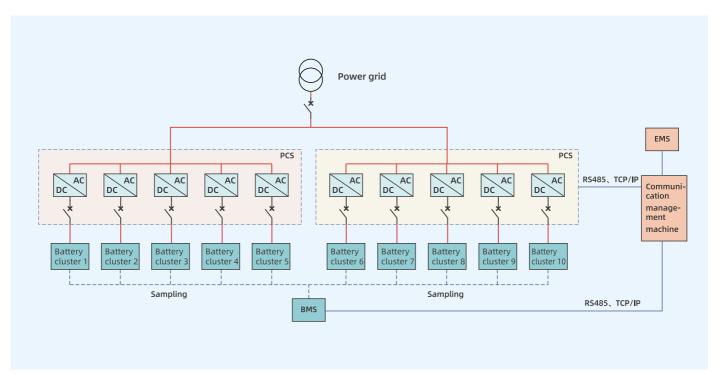


Arrangement diagram of container type energy storage system



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 p	arameters		
Model	LFPS-4850	LFPS-48100	LFPS-48155	76.8V155Ah	38.4V310Ah
D-#	Lithium iron	Lithium iron	Lithium iron	Lithium iron	Lithium iron
Battery type	phosphate	phosphate	phosphate	phosphate	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
imited 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%
	<u></u>	Structure & e	environment		·
2	482 ± 3mm	482 ± 3mm	483 ± 3mm	420 ± 3mm	420 ± 3mm
Standard dimensions	470 ± 3mm	470 ± 3mm	467 ± 3mm	651 ± 3mm	651 ± 3mm
$(W \times D \times H)$	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°C	- 20~ 55℃	−20~ 55°C	-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%



Small sized optical storage system (0.3kW~2kW)



Small sized optical storage system (3kW)









Small sized optical storage system (8kW)

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No. alah	RNES-P-	RNES-P-	RNES-P-	RNES-P-	RNES-P-
Model	15R36	19R2	23R04	26R88	30R72
Battery type	Lithium iron phos				
battery type	76.8V 50Ah	priate			
Battery pack	4 packs	5 packs	6 packs	7 packs	8 packs
battery pack	15.36 kWh	19.2 kWh	23.04 kWh	26.88 kWh	30.72 kWh
Rated power	8kW	10.2 RVVII	20.04 KWII	20.00 KWII	30.72 KVVII
Rated voltage	307.2V	384V	460.8V	537.6V	614.4V
Electric core capacity	3.2V50Ah		400.00		
Electric core connection	1P24S				
method in pack					
Pack connection method	1P4S	1P5S	1P6S	1P7S	1P8S
in battery cluster	1P45	1202	1202	1275	1282
Grid connection voltage	AC380V ± 15%				
Grid connection frequency	50/60Hz				
Cycle life	≥5000 cycles, or	5 years			
Operation mode	On-off grid				
Grid type	3 phases, 3 lines				
Communication interface and type	Wifi、RS485、GF	PRS			
Max. efficiency	93 67%				
Dimensions (W x D x H)	93.67%				
Operation temperature	700mm × 700mm × 1500mm				
Storage temperature	0~55℃ 				
Humidity range	-10~45°C				
Altitude	≤2000m	15%~90%			
Protection degree					
Cooling method		g, temperature control			
Weight	≤250kg	s, temperature control ≤300kg	≤350kg	≤400kg	≤450kg
v v ei Gi ir	<200ky	¦ ≪JUUNY	< ⊃⊃∪ky	- 400kg	= 400kg







Medium sized optical storage system (30kW/71.424kWh)



System parameter				
Model	RNES-P-71R424			
Output power/system energy	30kW/71.424kWh			
Battery type	Lithium iron phosphate			
Protection degree	IP21			
Guarantee	3 years for product, 10 years for performance			

Inverter parameter				
Max. PV current	180A	Rated output frequency	50/60Hz	
Max. PV voltage	1000V	Operation temperature	- 25~55℃	
Rated AC current	43A	Dimensions (W x D x H)	950 × 750 × 1860	
Max. charging/discharging power	30kW	Power factor	0.8 advance ~ 0.8 lag	
Number of phase	3P+N+PE	Weight	440kg	
Rated output voltage	400V	Communication interface	RS485、CAN	
Grid voltage range	360V-440V	Communication protocol	CAN、ModBus	

Technical parameter of battery & BMS			
Electric core model	3.2V155Ah		
Battery capacity	71.424kWh		
Weight	400kg		
Dimensions (W x D x H)	600×750×2000		
Cycle number	≽5000 cycles, or 5 years		
Electric core connection method in pack	1P24S		
Pack connection method in battery cluster	1P6S		



Medium sized optical storage system (30kW/130.944kWh)



System parameter			
Model	RNES-P-130R944		
Output power/system energy	30kW/130.944kWh		
Battery type	Lithium iron phosphate		
Protection degree	IP21		
Guarantee	3 years for product, 10 years for performance		

Inverter parameter				
Max. PV current	180A	Rated output frequency	50/60Hz	
Max. PV voltage	1000V	Operation temperature	- 25~55℃	
Rated AC current	43A	Dimensions (W x D x H)	950 × 750 × 1860	
Max. charging/discharging power	30kW	Power factor	0.8 advance ~ 0.8 lag	
Number of phase	3P+N+PE	Weight	440kg	
Rated output voltage	400V	Communication interface	RS485、CAN	
Grid voltage range	360V-440V	Communication protocol	CAN、ModBus	

	Technical parameter of battery & BMS
Electric core model	3.2V155Ah
Battery capacity	130.944kWh
Weigh	560kg
Dimensions (W x D x H)	900*750*2000
Cycle number	≥5000 cycles, or 5 years
Electric core connection method in pack	2P12S
Pack connection method in battery cluster	1P11S

Medium sized optical storage system (30kW/142.848kWh)



System parameter			
Model	RNES-P-142R848		
Output power/system energy	50kW/142.848kWh		
Battery type	Lithium iron phosphate		
Protection degree	IP21/IP65 (container)		
Guarantee	3 years for product, 10 years for performance		

Inverter parameter				
Max. PV open circuit voltage	DC1000V	Recommended PV power	50kWp	
PV voltage range	DC480V~DC800V	Rated output frequency	50/60Hz	
Battery voltage range	DC352V~DC600V	Frequency range	45~55/55~65Hz	
Max. charging/discharging power	50kW	Operation temperature	- 25~55℃	
Max. charging/discharging current	142A	Dimensions (W x D x H)	950 × 750 × 1860	
Rated AC current	72A	Weight	440kg	
Number of phase	3P+N+E	Communication interface	RS485、CAN	
Rated AC voltage	AC400V	Communication protocol	ModBus RTU 、CAN	
AC voltage range	AC360V~AC440V	On-off grid switching time	Automatic, ≤10ms	

	Technical parameter of battery & BMS
Electric core model	3.2V155Ah
Battery capacity	142.848kWh
Weigh	≤2000kg
Dimensions (W x D x H)	1000×750×1860
Cycle number	≥5000 cycles, or 5 years
Electric core connection method in pack	2P12S
Pack connection method in battery cluster	1P12S



Medium sized optical storage system (60kW/226.176kWh)



AC voltage range	± 15%				
Technical parameter of battery & BMS					
Electric core model	3.2V155Ah				
Battery capacity	226.176kWh				
Weigh	2600kg				
Dimensions (W x D x H)	1900 × 750 × 2000				
Cycle number	≥5000 cycles, or 5 ye	ars			
Electric core connection method in pack	2P12S				
Pack connection method in battery cluster	1P19S				

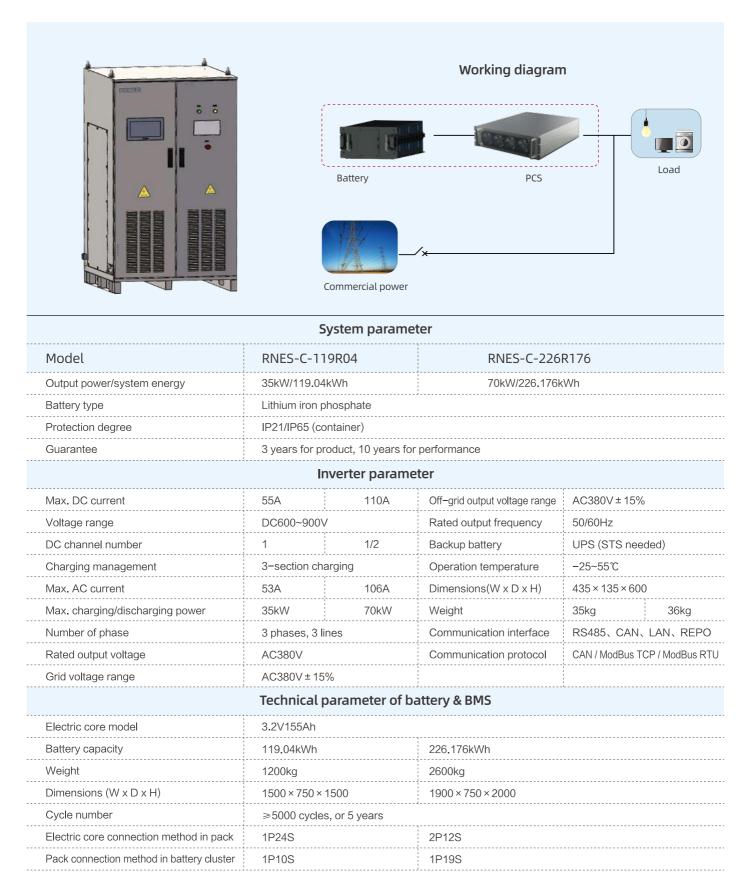
Medium sized optical storage system (100kW/214.272kWh)



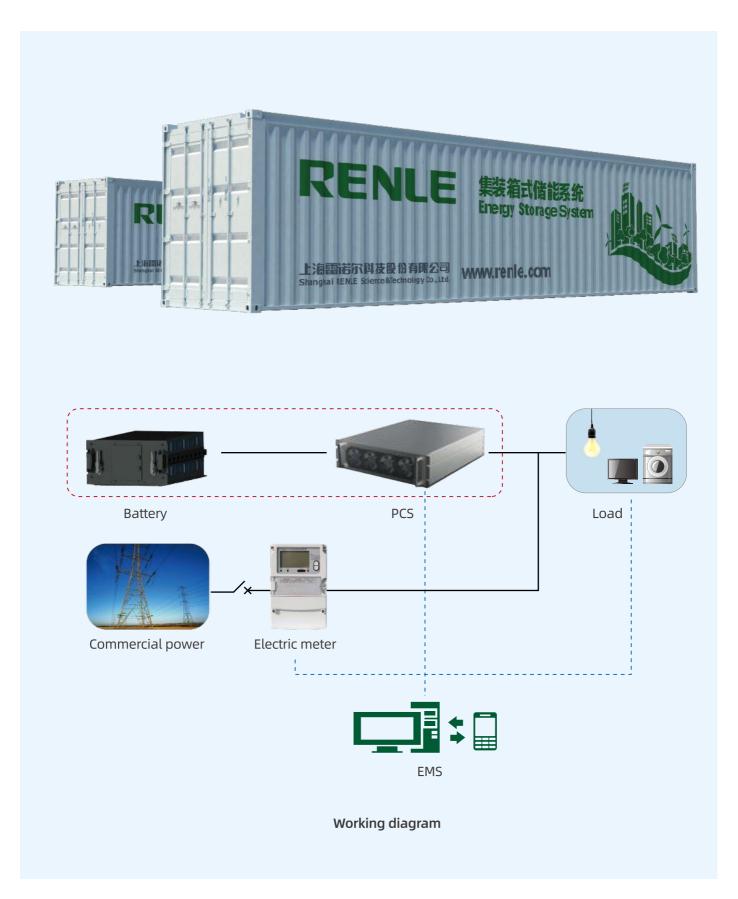
System parameter			
Model	RNES-P-214R272		
Output power/system energy	100kW/214.272kWh		
Battery type	Lithium iron phosphate		
Protection degree	IP54		
Cooling method	Battery cabinet, air conditioner electric cabinet, smart air cooling		
	Inverter parameter		
Max. DC current	228A		
Voltage range	DC500~900V		
Max. AC current	159A		
Max. charging/discharging power	100kW		
Number of phase	3 phases, 5 lines		
Rated output voltage	AC400V		
Grid voltage range	340~460VAC (range can be set)		
Off-grid output voltage accuracy	1%		
Rated output frequency	50/60Hz		
On-off grid switching time	Normal condition <200ms (under special conditions SCR are required for zero switching		
Operating temperature	_25~55°C		
Dimensions (W x D x H)	800×800×1800		
Communication interface	RS485, CAN, Ethernet, GPRS		
Communication protocol	CAN、ModBus TCP、ModBus RTU		
Weight	730kg		
	Technical parameter of battery & BMS		
Electric core model	3.2V155Ah		
Battery capacity	214.272kWh		
Weight	1200kg		
Dimensions (W x D x H)	2200 × 1200 × 2200		
Cycle number	≥5000 cycles, or 5 years		
Electric core connection method in pack	2P12S		
Pack connection method in battery cluster	1P18S		



Energy storage system



Container type energy storage system





	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°C	
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.