HIGH RATE ENERGY STORAGE

QINKUAL Energy Storage Product Manual

Leading the trend of high-rate energy storage

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Leading the trend of high-rate energy storage

QINKUAL 颀刻®

LEADING THE TREND OF
HIGH-RATE ENERGY STORAGE

SUPERIOR PERFORMANCE
QINKUAL CREATION

Company Profile

QINKUAL 顷刻®

CELL LEADER OF FULL TEMPERATURE ADAPATABILITY HIGH C-RATE

Focus on Battery Technology Innovation
Create Zero-carbon Future Together

Shaanxi Qinkual Energy Technology Co, Ltd. is a technology company belongs to the larges-cale state-owned energy and chemical group Shaanxi Coal & Chemical Industry Group, focusing on energy storage and application.

After 10 years of technical precipitation, we hold the feature of FULL TEMPERATURE ADAPTABILITY—HIGH C-RATE. Based on two major technology platforms, "ULTRA" and "QUEST", we provide energy storage and power batteries and ESS solutions for various segmented applications including new infrastructure construction, high power automotive power, high power energy storage, and special applications.

In order to further extend the industrial chain and focus on expanding the business of the power industry, Qinkual Energy has obtained the second level qualification for general contracting of power engineering construction, which accelerates our transformation into a provider of overall energy storage system solutions.

500 Million Investment | **4** GWh Annual Capacity | **10+** Years Development history

Introduction to Application

Source Side

For the source side, energy storage systems provide energy translation function, optimize the output curve, reduce the unavailable wind and solar power, improve the response speed of thermal power units, and also provide system inertia control and adjust speed and accuracy.

Applications:

- Peak shaving
- Power smoothing
- Frequency modulation auxiliary service
- Reserve capacity
- Schedule tracking

Load Side

For the load side, energy storage systems provide intelligent load management for the power grid, modulate peak and frequency according to the grid load, and ensure stable operation of distribution side equipment to efficiently support the transmission of new power systems.

Applications:

- Relieve capacity blockage
- Voltage support
- Delay PTD expansion and upgrading
- Ancillary service in power market

User Side

For the user side, energy storage systems provide users with efficient energy management services, reducing their electricity costs by commercial models such as peak valley arbitrage, demand control, and demand side response, and can also be backup power to reduce outage loss. Besides, user side can be extended to more applications, such as communication stations power, PV + ES + charger system, and virtual power plants, to assist in new power system construction.

Applications:

- Peak-valley arbitrage
- Demand control
- Communication station backup power
- PV + ES + charger system
- Virtual power plants

Micro Grid

Micro grid is constructed by energy storage systems and new energy generation equipment combining diesel generators, to provide power to remote or island areas, achieving multi-energy complementarity and spontaneous self-use in no-electricity areas. Industrial and commercial microgrids can also continuously provide clean energy for DC or AC loads.

Product advantages

5 Core Product Advantages Providing Infinite Possibilities

High power

Support maximum 2P system power to quickly respond frequency modulation

Long life

Maintain cell temperature difference within 2℃ and support 10 years calendar life

Real Safety

Integrate battery cells explosion proof valve detection
Integrate pack, rack, and system triple fire suppression
IP67 battery module protection level

Easy to integrate

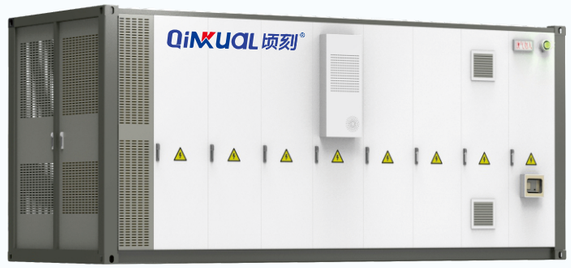
Support one-rack-one-unit by battery modular design, no inter-rack circulation
Compatible with full series of Qinkual high power cell products

Easy to manage

Data interacts in real time. Support electricity statistics, fault alarm, thermal runaway alarm, etc.

Energy Storage Products

Energy Storage Container



The picture is are for reference only, please refer to the actual product

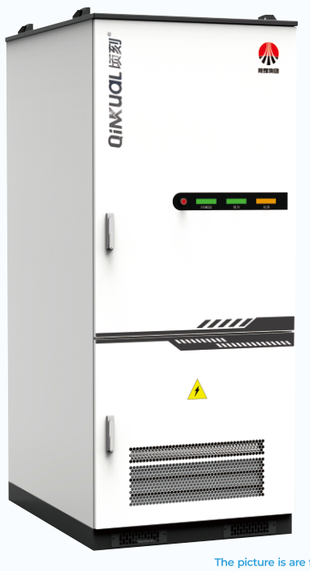
1. **High Power** — Support 0.25P-2P system power covering both high power and high capacity type
2. **Long Life** — Maintain temperature difference of cells within 2℃ and 5℃ between racks, supporting 10 years calendar life
3. **Real Safety** — Integrate battery cells explosion proof valve detection Integrate pack, rack, and system triple fire suppression
   IP67 battery module protection level
4. **Easy to Integrate** — Support one-rack-one-unit by battery modular design, no inter-rack circulation
   Compatible with full series of Qinkual high power cell products
5. **Easy to Configure** — Flexible expansion and place
6. **Easy to Manage** — Data interacts in real time.
   Support electricity statistics,fault alarm, thermal runaway alarm, etc.

Capacity	3.54MW/1.77MWh	2.5MW/2.5MWh	4MW/4MWh	2.5MW/5MWh	
Number of Racks	14	10	10	12	12
Configuration	14*1P396S	10*1P392S	10*1P400S	12*1P396S	12*1P416S
Nominal Voltage (V)	1267.2	1254.4	1280	1267.2	1331.2
Voltage Range (VDC)	1108.8~1425.6	1094.6~1425.6	1120~1440	1108.8~1425.6	1164.8~1497.6
Nominal Power (MW)	3.54	2.5	4	2.5	2.5
Nominal Capacity (MWh)	1.77	2.5	4.02	5.07	5.02
Nominal Charging Discharging Current (A)	2*1400	2*1000	2*1570	1980	1884
Nominal Charging Discharging C-rate (P)	2	1	1	0.5	0.5
Number of Branch	2	2	2	1	1
Fire Suppression	Perfluoro + water spray				
Cooling	Liquid cooling				
Dimension (mm)	6350*2438*2896	6058*2438*2896	6058*2438*2896	6350*2438*2896	6058*2438*2896
Weight (t)	35	32	35	40	40

Energy Storage Products

I-C Energy Storage Cabinet

1000V Liquid Cooling Energy Storage Cabinet



The picture is are for reference only, please refer to the actual product

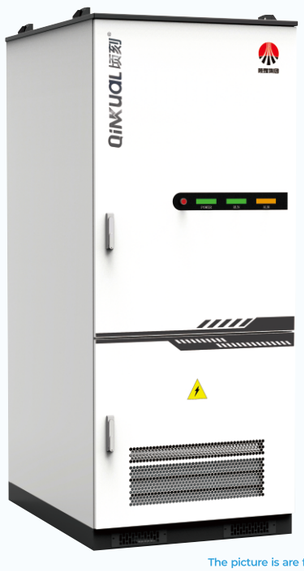
1. **Real Safety** — Single-unit design without inter-rack circulation, integrate pack and rack level perfluoro fire suppression
2. **High Efficiency** — No transformer with higher system efficiency
3. **Long Life** — Maintain temperature difference of cells within 2℃ and 5℃ between racks, increasing 20% system life
4. **Easy to Configure** — Flexible expansion and place
5. **Grid Friendly** — TN-C with 100% unbalanced load

	Capacity	125kW/250kWh	125kW/261kWh	125kW/80kWh	125kW/143kWh	240kW/241kWh
DC Side	Battery Type	LFP				
	Configuration	1P240S	1P260S	1P252S	1P224S	1P240S
	Nominal Voltage (V)	768	832	806.4	716.8	768
	Operating Voltage Range (V)	672 ~ 864	728 ~ 936	705.6 ~ 907.2	627.2 ~ 806.4	672 ~ 864
	Electricity (kWh)	252	261	80	143	241
AC Side (Ongrid)	Nominal AC Power (kW)	125	125	125	125	240
	Nominal Current (A)	180	180	180	180	346
	Nominal AC Voltage	400/230 (-20%~15%)				
	Frequency Range (Hz)	50 / 45~55 60 / 55~65				
	Harmonic	<3% (Nominal Power)				
	Adjustable power factor	−0.95 ~ 0.95				
AC Side (Offgrid)	Nominal AC Power (kVA)	125	125	125	125	240
	Nominal AC Voltage (V)	400/230 (-5%~5%)				
	Harmonic	<1%(Nominal Power)				
	Frequency Range (Hz)	50/45~55 60/55~65				
System	PCS Maximum Power	0.99				
	Dimension (mm)(W*L*H)	1400*1500*2350	1400*1500*2350	1400*1400*2150	1400*1400*2015	1400*1500*2350
	Weight (kg)	1300	1400	2000	1400	2500
	Protection Level	IP55				
	Environment Temperature	-30 ~ +55℃				
	Maximum Height	4000m(derating above 3000m)				

Energy Storage Products

I-C Energy Storage Cabinet

1500V Liquid Cooling Energy Storage Cabinet



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2. **High Efficiency** — No transformer with higher system efficiency
3. **Long Life** — Maintain temperature difference of cells within 2℃ and 5℃ between racks, increasing 20% system life
4. **Easy to Configure** — Flexible expansion and place
5. **Grid Friendly** — Three-phase three-wire system that increases transmission efficiency and ensures grid safety

	Capacity	215kW/418kWh	215kW/422kWh	250kW/126kWh	215kW/250kWh	400kW/402kWh
DC Side	Battery Type	LFP				
	Configuration	1P416S	1P400S	1P396S	1P392S	1P400S
	Nominal Voltage (V)	1331.2	1280	1267.2	1254.4	1280
	Operating Voltage Range (V)	1164.8 ~ 1497.6	1120 ~ 1440	1108.8 ~ 1425.6	1097.6 ~ 1411.2	1120 ~ 1440
	Electricity (kWh)	418	422	126	250	402
AC Side (Ongrid)	Nominal AC Power (kW)	215	215	250	215	400
	Nominal Current (A)	180	167	209	180	335
	Nominal AC Voltage	400/230(-20% ~ 15%)				
	Frequency Range (Hz)	50/45~55 60/55~65				
	Harmonic	<3% (Nominal Power)				
	Adjustable power factor	−0.95 ~ 0.95				
AC Side (Offgrid)	Nominal AC Power (kVA)	215	215	250	215	400
	Nominal AC Voltage (V)	400/230(-5% ~ 5%)				
	Harmonic	<1%(Nominal Power)				
	Frequency Range (Hz)	50/45~55 60/55~65				
System	PCS Maximum Power	0.99				
	Dimension (mm)(W*L*H)	1400*1500*2550	1400*1500*2550	1400*1550*2550	1400*1500*2550	1400*1500*2550
	Weight (kg)	4000	4000	2000	3000	4000
	Protection Level	IP55				
	Environment Temperature	-30 ~ +55℃				
	Maximum Height	4000m(derating above 3000m)				

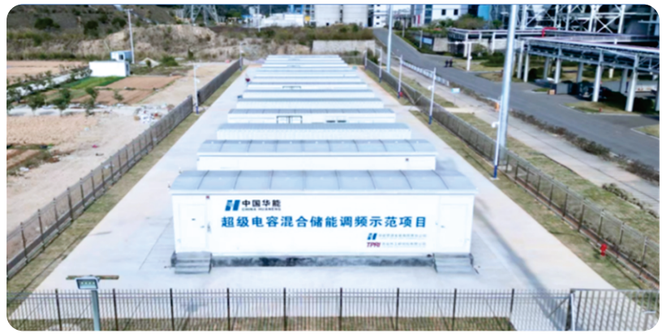
Project Cases

SUPERIOR PERFORMANCE
QINKUAL CREATION

Huaneng Luoyuan Power Plant

15MW/7.5MWh

The world's first high-power lithium battery + super capacitor hybrid auxiliary frequency regulation system



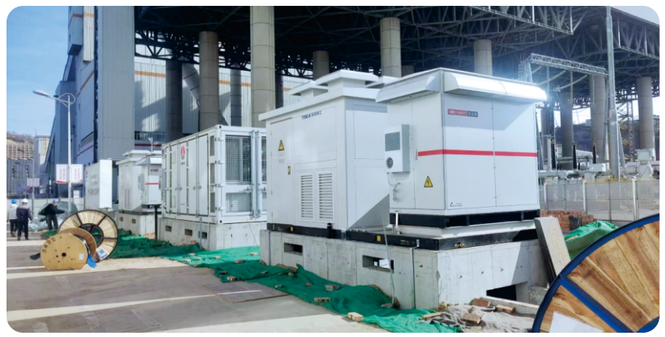
Huaneng Tongchuan Power Plant

15MW/15MWh

High-power lithium battery + super capacitor hybrid thermal power energy storage combined with frequency regulation

Xinyuan Clean Energy Power Plant

The northwest China's first lithium battery + sodium-ion battery 2P high power hybrid energy storage and frequency regulation project



In the future, QINKUAL®
will continue to be motivated by technological innovation.

Join hands with global customers to
enter a zero-carbon society and
guide the world towards a green future

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