



Sieyuan

Make Electric Power Transmission and Distribution
safer, more Controllable and more Efficient

LW58A Dead tank circuit breaker



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About Us

Brief introduction to Sieyuan Electric Co., Ltd/ Shanghai Sieyuan High Voltage Switchgear Co., Ltd.

Sieyuan Electric Co., Ltd., as a domestic well-known supplier in power transmission and distribution equipment and provider in system solutions, was established in 1993, and listed in Shenzhen Stock Exchange in 2004 (stock code: 002028), currently with 9 subsidiaries: therein, Jiangsu Rugao High Voltage Electric Apparatus Co. Ltd. has 40 years' history in R&D and production of high voltage switchgears. In September of 2007, Sieyuan Electric invested another RMB 400 million based on Jiangsu Rugao High Voltage Electric Apparatus Co. Ltd. to establish Shanghai Sieyuan High Voltage Switchgear Co., Ltd., to specialize in R&D and production of (H) GIS products and tank circuit breakers, in view of the enhanced capacity of GIS and geographical advantage.

The main products are 72.5-550kV (H) GIS and tank circuit breaker. The businesses of the company has spread over the domestic and overseas power grid, power generation, metallurgy, coal mine, chemical, and transportation industries, etc. The company covers an area of 63874m², with office building of 8800m² and workshop of 43000m²: therein, the assembly workshop of 100,000 class covers an area of 5000m², and assembly workshop of 300,000 class covers an area of 8000m², featuring annual production of 2000 bays of 72.5/126/145kV, 1200 bays of 252kV, 120 bays of 363/380/420kV, 120

bays of 550kV, 500kV and 1000kV fully shielded high-voltage testing hall, equipped with 1500kV and 3000kV impulse voltage generator and automated measurement system. The main production equipments are all imported from abroad and the production condition and manufacturing technology reach international advanced level.

With the top-notch R&D ability, the company has established postdoctoral research station and technical center, forming a R&D team of nearly one hundred persons led by 6 doctors and over 40 masters. The company adheres to technical innovation, applies function analysis, failure mode and effects analysis (FMEA), whole-process quality characteristic analysis, dimension chain analysis and simulation analysis and other advanced design concept and method, and has established the technology development system of proprietary intellectual property rights. The leading products and core technologies of the company are both leading in the country.

All products of the company have passed type tests of national authoritative testing institutions and Netherlands KEMA Lab, with the product performance reaching international leading level.

Company distribution



Our products

T&D equipments

- 72.5kV ~ 550kV GIS/HGIS
- 500kV and below CT/PT/CVT
- 750kV and below Disconnector
- 220kV and below Switch
- 1000kV Power Capacitor
- Reactor
- SVG

Neutral point grounding devices

- Grounding transformer
- Arc suppression coil

On-line monitoring devices

- Oil chromatogram on-line monitoring
- Insulation on-line monitoring

Automation products, Smart substation, etc



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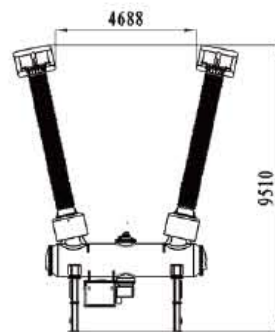
Innovative Technology, Lean Manufacturing!

Advantages of LW58A Dead tank circuit breaker:

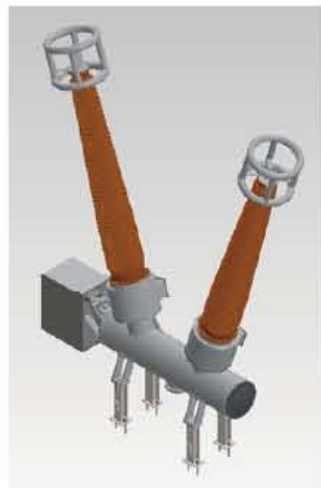
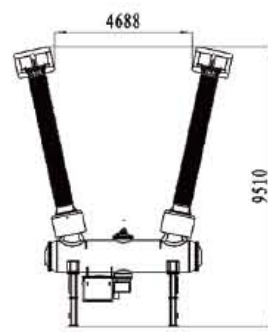
- The circuit breakers are all equipped with pure spring operating mechanisms which makes structure simple and highly reliable. The mechanical endurance for the operating mechanism is over 10000 times, and it is convenient for maintenance and meets mechanism's requirements for oil-free and air-free.
- The partial discharge for the total bay is less than 5pC and less than 3pC for insulators under 80% power frequency withstand voltage, which is far more strict than 1.2 times of phase voltage specified by IEC standard.
- The temperature rise type test was performed at 1.1x rated current, thus the ability of GIS to withstand long time rated current can be assured.
- The flanges adopt dual-seal structural design, the outer seal ring is water-proof and inner seal ring is gas-proof. Therefore, it can reduce the leakage of the product greatly and makes the product more suitable for outdoor operation.



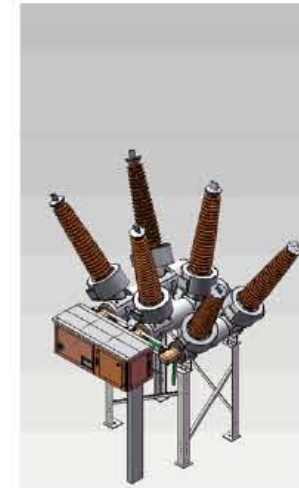
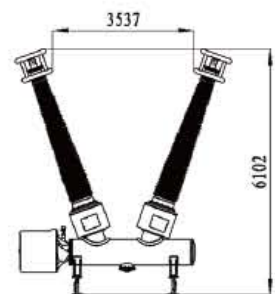
LW58A-550 T-GCB



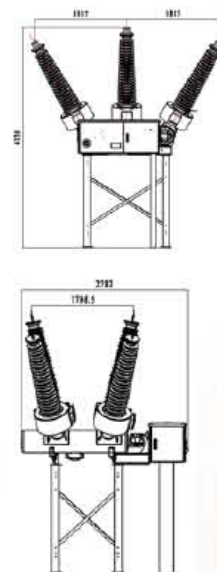
LW58A-252 T-GCB



LW58A-363/420 T-GCB



LW58A-126/145 T-GCB



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Product profile

Circuit Breaker

- The circuit breaker uses self-energy arc-extinguishing principle, and reduces operation power of the mechanism and enhance operational reliability of product.
- With the excellent breaking and operating performance, the circuit breaker is in Class M2-C2.
- The circuit breakers have passed type tests of national authoritative testing institutions and Netherlands KEMA Lab.



Arc-extinguishing principle

High breaking current: Self-energy principle:

- The arc combustion makes SF6 gas in the thermal expansion chamber fiercely expanding to generate gas flow blowing to the nozzle to extinguish the arc.

Low breaking current: Puff type principle:

- SF6 gas in the compression chamber is compressed to generate gas flow, blowing to the nozzle to extinguish the arc, which then extinguishes.

Mechanism of circuit breaker

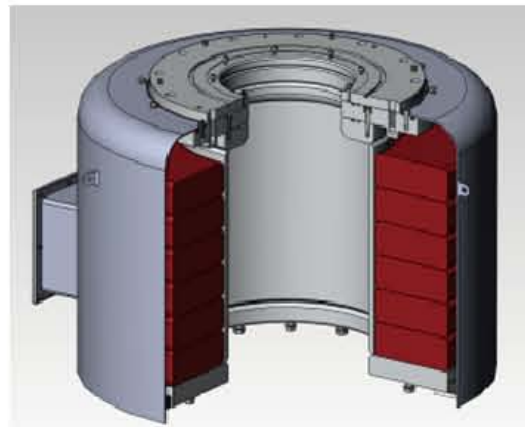
- The full-spring operating mechanism has a small volume and achieves 10,000 times of mechanical endurance.
- Based on function design method and simulation analysis of mechanism dynamics, function analysis, and through strict dimension chain calculation, FMEA analysis, with the high-power spring operating mechanism of independent R&D.
- The operating mechanism base is made of cast aluminum alloy and is produced through the precision machining in the numerical control machining center of DMG four-shaft boring and milling imported from Germany. Because of one-step molding by clamping machining, unified standard and minor machining error, the assembly accuracy of the operating mechanism can be guaranteed.
- Lower wear, lower noise, less maintenance, long mechanical endurance (10000 times).
- Wide running temperature range of mechanism: long-term running available under -40°C ~ 55°C range.



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Current transformer

- The electromagnetic current transformer placed on the incoming and outline lines sides of the circuit breaker, is located in different compartment from circuit breaker.
- The external coil structure is used, which is entirely cast with inside shell; and the outside is protected by rain cover; the outside of the coil adopts special waterproof structure to reach better moisture-proof effect.
- The secondary winding is cast with the saturated epoxy resin, with high electrical and mechanical strength and good heat resistance.



SF6/air bushing

- There are two types of bushings: porcelain bushing and composite bushing to meet demands of different user requirements.



Porcelain bushing



Composite bushing

Local control cabinet

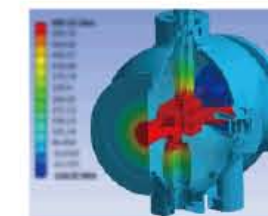
- Verification of the degree of protection: IP55, IK10, wide temperature range(-40℃~55℃).
- Adopting integrated bending technique, artistic in appearance, high in strength and sound in impermeability.
- The internal components adopt international famous brands, with reliable quality.



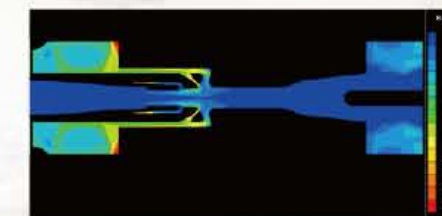
Basic research ability



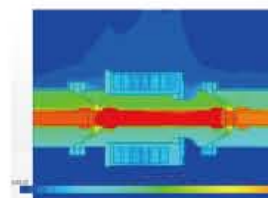
Simulation analysis of mechanism motion process of circuit breaker



3D electric field analysis



Flow field analysis



Temperature rise analysis



Enclosure mechanical strength analysis

Quality assurance

Inspection capacity for raw materials



Three coordinate measuring equipment



Spring testing equipment



Tensile testing equipment



X-ray inspection equipment



Material analysis device



Helium(He) Leak Detector

Production Capacity



Final-assembly Workshop 1,000,000 Cleaning Grade, covers an area of 8,000m²



Sub-assembly Workshop 100,000 Cleaning Grade, covers an area of 5,000m²



Hübers vacuum mixing epoxy casting equipment*2 sets



Chain type automatic painting line



Automatic silver plating production line

Test capability



3,000kV impulse voltage generator and 1,000kV power frequency withstand voltage and partial discharge test system



Test transformer, coupling capacitor and impulse voltage lead-in bushing and 1,500kV impulse voltage generator



Quality assurance

Package

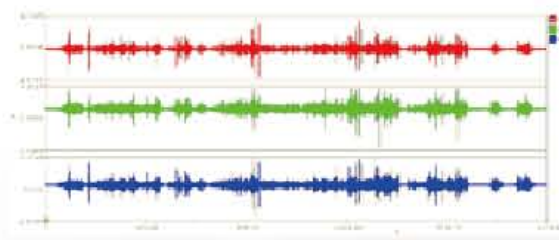
- N₂ is filled into the bay under transportation pressure with moisture proof, dust proof and anti-corrosion packaging.
- Assemble vibration indicator on each transportation unit.



Optional choice to assembly vibration recorder according to customers.



Vibration recorder



Vibration recorded data

Installation and maintenance

- The transportation units are fully assembled and tested in the factory to minimize the site installation.
- The installation work strictly abides by the provisions of "instructions for field operation" and is carried out rapidly and effectively under the guidance of after-sales service engineers who have rich electrical experience.

Service

- Establish the archives of product installation and maintenance and perform the spare parts management of full life cycle.
- Periodically pay a return visit to customers, understand the customer demand.
- Establish the emergency service barrier-free channel, so as to ensure the contact channel smooth and effective and make the acceptance of customer service demand more rapid and more convenient.

Main technical parameters:

1	Rated Voltage	kV	126/145	252	363/420	550	
2	Rated Frequency	Hz	50/60				
3	Rated Current	A	3150	4000	4000	6300	
4	Rated breaking current	kA	40	50	50	63	
5	Rated short-time withstand current	kA	40	50	50	63	
6	Rated short-circuit duration	s	4	3	3	3	
7	Rated peak withstand current	kA	100	125	135	171	
8	Rated Power Frequency Withstand Voltage (1min , r.m.s)	To earth	kV	275	460	510	740
		Between Open Contacts	kV	275+84	460+145	510+210	740+315
9	Rated Lightning Impulse Withstand Voltage (peak)	To earth	kV	650	1050	1175	1675
		Between Open Contacts	kV	650+118	1050+206	1175+295	1675+450
10	Rated Switching Impulse Withstand Voltage (peak)	To earth	kV	/	/	950	1300
		Between Open Contacts	kV	/	/	850+295	1175+450
11	Partial Discharge	Test voltage	kV	0.8×275	0.8×460	0.8×510	0.8×740
		Total Bay	pC	≤5			
		Each Insulator	pC	≤3			
12	SF ₆ Gas Pressure (at 20°C)	Rated Pressure	MPa	0.58	0.62	0.68	0.58
		Alarm Pressure	MPa	0.53	0.58	0.63	0.53
		Lockout Pressure	MPa	0.5	0.55	0.6	0.5
13	Mechanical Endurance	times	10000				
14	Leakage Rate of SF ₆ Gas Per Year	%	≤0.3				
15	Service Life	years	≥30				
16	Maintenance Cycle	years	≥20				
17	Ambient temperature range	/	-40°C ~ 55°C				