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平高集团有限公司
PINGGAO GROUP CO., LTD.



电力金具



Electric Power Fittings

Pinggao Group Electric Power Fittings Company

平高集团有限公司电力金具公司

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Enterprise Profile

Pinggao Group Co., Ltd., firstly named as Pingdingshan High Voltage Switch-gear Factory established in 1970, is a major domestic switch-gear development and manufacture enterprise. As a result of innovation and development for more than 40 years, Pinggao Group has become a base of researching, developing and manufacturing high voltage, extra-high voltage, ultra-high voltage switch-gears and other important equipment in China, and also is the pillar enterprise of important technical equipment in the national electrical industry. In 2008, Pinggao Group (PG) won the "China Famous Trademark" title.

The corporate business covers R&D, design, manufacture, sales, testing, related equipment sets, service and project contracting of power transmission and distribution equipment. The core business focuses on manufacture, R&D, sales and service of medium-voltage, high-voltage, ultrahigh-voltage, extra-high-voltage AC/DC switch-gears and electric power fittings.

The company covers an area of 1.33 million square meters, with the building area of 550,000 square meters. It owns more than 5,300 units (sets) of main processing equipment, including more than 200 units (sets) of various types of CNC processing equipment. The company has strong R&D strength and technical innovation capability, and owns ten major technological innovation platforms such as the State-certified Enterprise Technology Center and the China Machinery Industry AC High-Voltage Switch-gear Technology Center, establishing a research and development system with whole AC/DC series, full-voltage-class switch-gears and flexible power transmission and transformation equipment as the research subjects. Over the years, major breakthroughs have been made in key technical fields such as high-voltage,

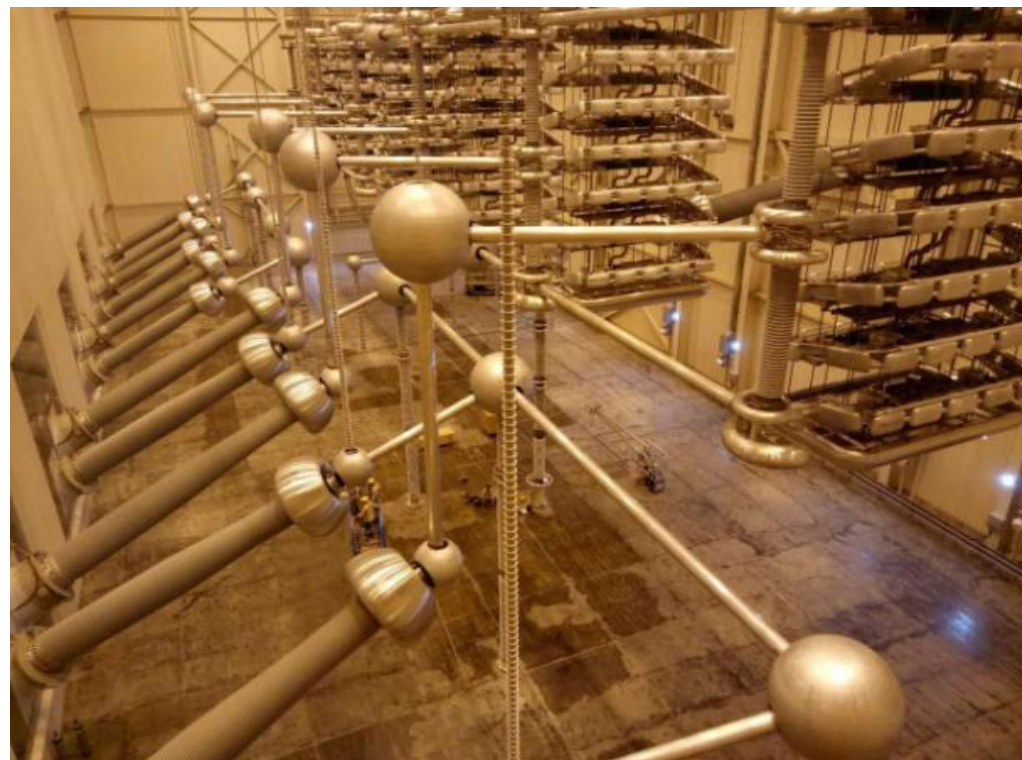




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Electric Power Fittings Company was established in October 2012, concentrating on R&D and manufacture of electric power fittings. At present, there are 51 employees in the Electric Power Fittings Company, including 30 technicians, 2 professor-level senior engineers, 2 senior engineers, 12 engineers, 2 postgraduate students and 25 undergraduates. After years of development, the company has trained a group of professionals engaged in R&D design, manufacture, assembly, debugging and test verification of electric power fittings and with the abilities of **developing, designing and producing products** such as converter station fittings, line fittings and power transmission fittings. Electric power fittings produced have been applied to more than 20 key projects at home and abroad. **In particular, electric power fittings in DC equipment have a market share of more than 50% in China.**





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Production Equipment

The company owns more than 5,300 main processing equipment, including more than 200 CNC machining equipment. It has world-class professional production lines like machining centers, insulator manufacture lines, conductor silver plating lines, shell manufacturing and coating lines and rubber seal manufacture lines. At present, Pinggao Group masters the core manufacturing technology of 126~1100kV full-voltage-class switchgears representing the R&D and manufacturing level of China's high-voltage switchgears, with its brand, scale, strength and sustainable development capability ranking the top in the domestic industry. The group has established a complete electrical equipment manufacturing process system, including professional production lines for vacuum epoxy resin casting, silver plating of copper/aluminum parts and machining, domestic first-class electrical equipment product assembly lines and voltage test stations, and fully had capabilities of designing, manufacturing and assembling products in the field of electric power fittings.



1000- ton horizontal cold chamber die casting machine



Horizontal machining center



1600-ton friction press



CNC plasma cutting machine imported from the United States



Vertical machining center from Japan Mazak Corporation



Boring center from Japan Toshiba Machinery Co., Ltd.



LG Mazak vertical machining center



Horizontal machining center imported from Taichung Seiki



CNC machine tool from US Harding Company

Main Products

Power fittings are divided into three categories according to application sites.

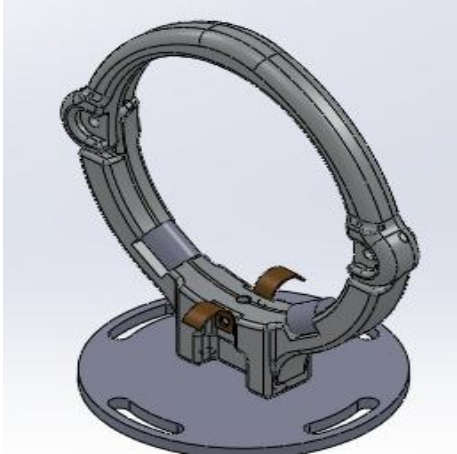
Fittings for converter station valve halls and DC fields: applied to converter station valve hall and DC field areas.

Substation fittings: applied to AC substations, power plant distribution areas or converter station exchange areas.

Line fittings: applied to AC/DC overhead lines.

Converter station DC field fittings

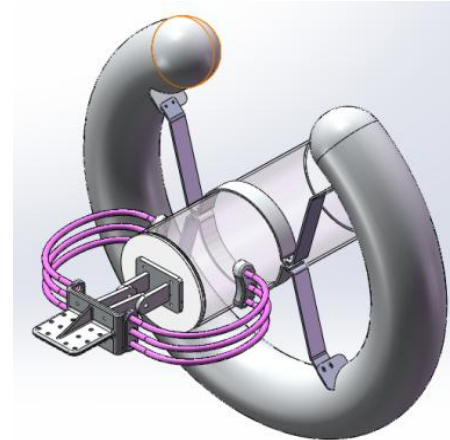
The DC field fittings mainly include tubular-bus bar support type fittings, soft bus bar type fittings, tubular bus bar and soft bus bar conversion fittings, and DC deicing circuit fittings. Tubular-bus bar support fittings mainly include fixed supports, tubular-bus bar and equipment connection telescopic fittings, and tubular-bus bar butt-joint telescopic fittings. Soft bus bar type fittings mainly include soft bus bar spacers and terminal clamps, tubular bus bar and soft bus bar conversion type fittings, 4-bundle tubular-bus bar clamps and 6-bundle tubular-bus bar clamps.



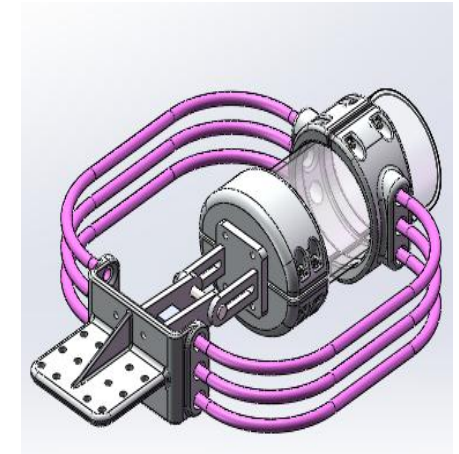
Tubular-bus bar support fittings (sliding)



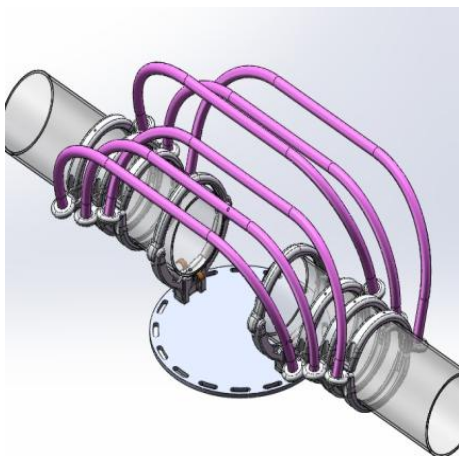
Horizontal connection fittings for tubular bus bar $\phi 450$ equipment terminals



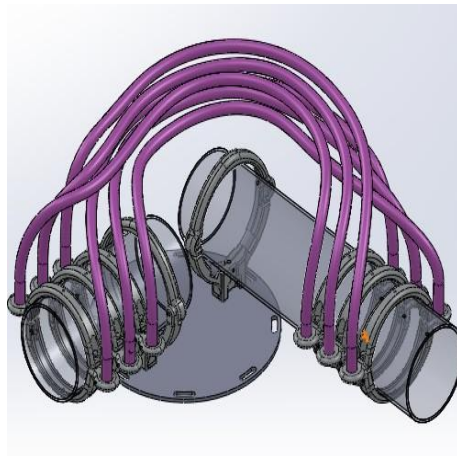
Telescopic fittings for fixed ends of tubular bus bars $-\phi 450$ of equipment terminals



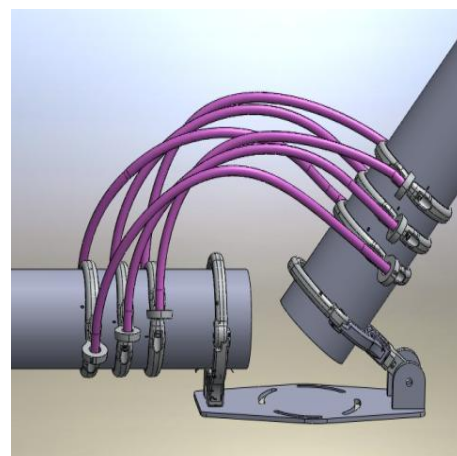
Telescopic fittings for sliding ends of tubular busbars $-\phi 250$ of equipment terminals



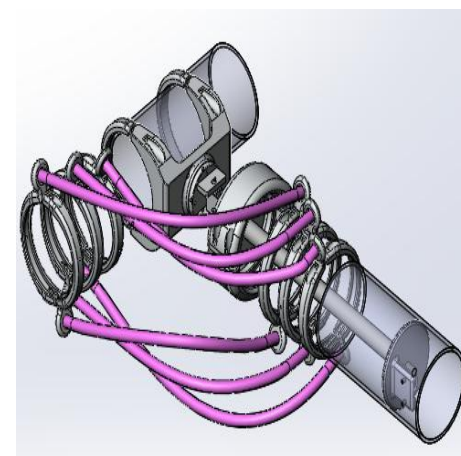
Horizontal connection fittings for tubular bus bars



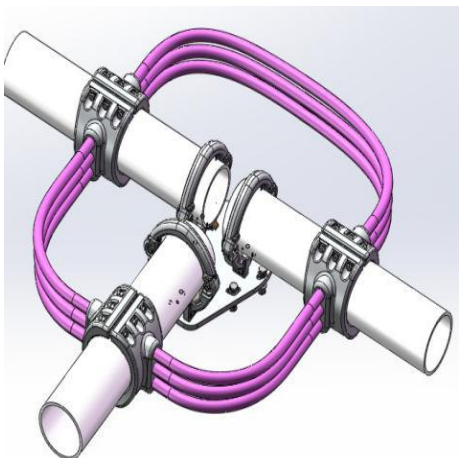
Vertical connection fittings for tubular bus bars



Inclined connection fittings for tubular bus bars



T joint fittings for tubular bus bars



Three-section T joint fittings for tubular



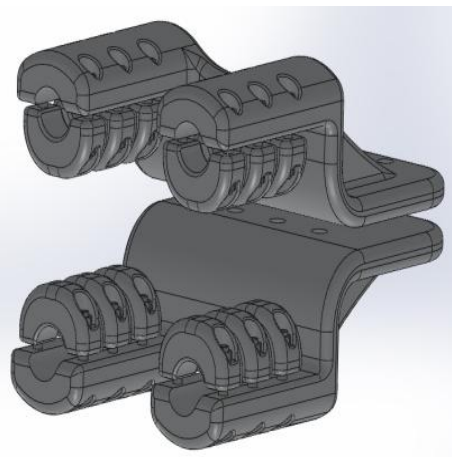
4-bundle spacers



4-bundle spacers



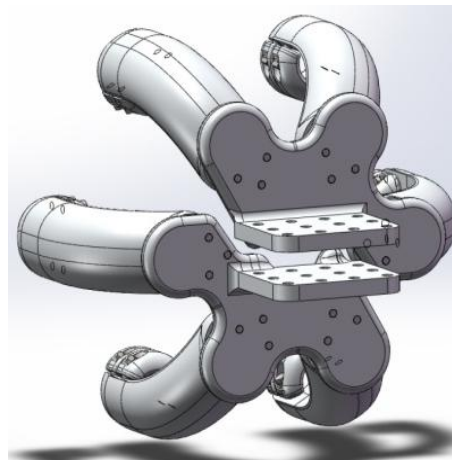
6-bundle spacers



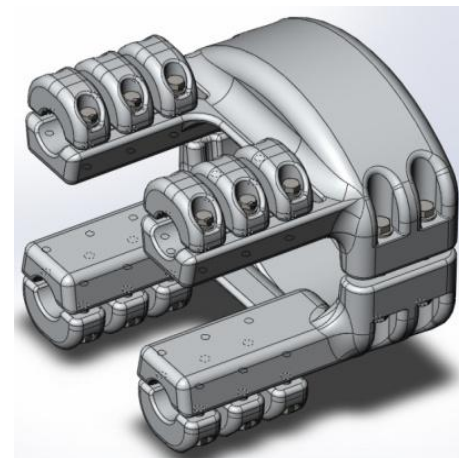
4-bundle terminal clamps



6-bundle terminal clamps



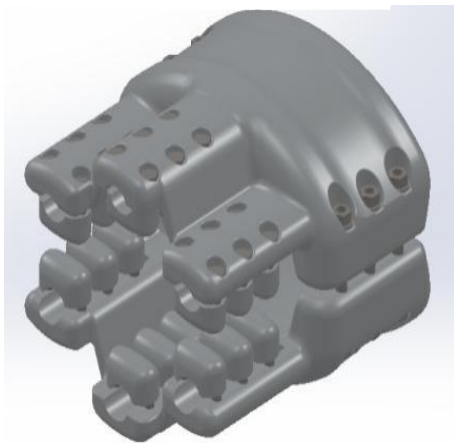
6-bundle terminal clamps



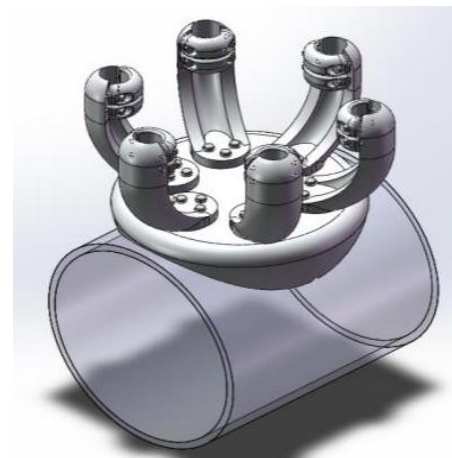
4-bundle tubular-bus bar horizontal clamps



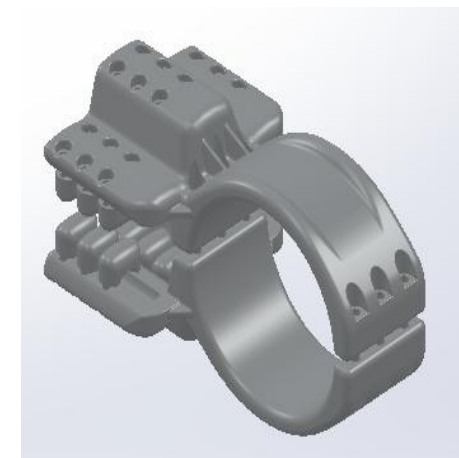
4-bundle tubular-bus bar T jointing clamps



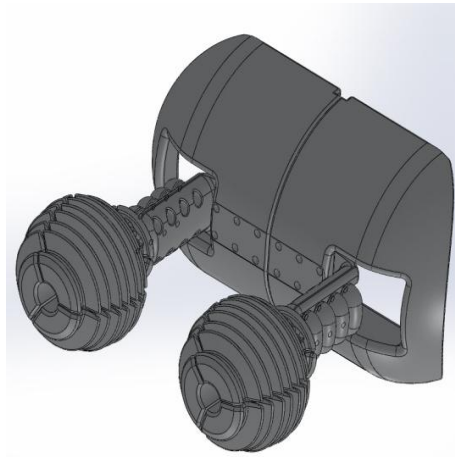
6-bundle tubular-bus bar horizontal clamps



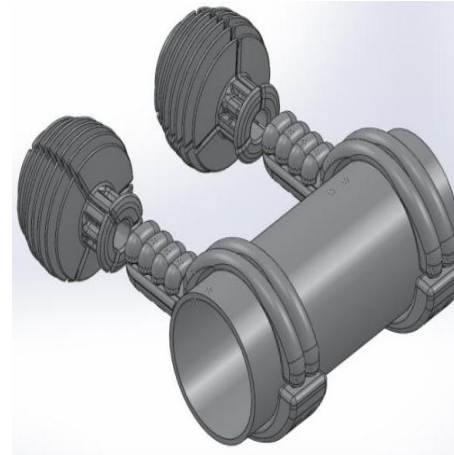
6-bundle tubular-bus bar T jointing clamps



6-bundle tubular-bus bar T jointing clamps



DC deicing circuit fittings

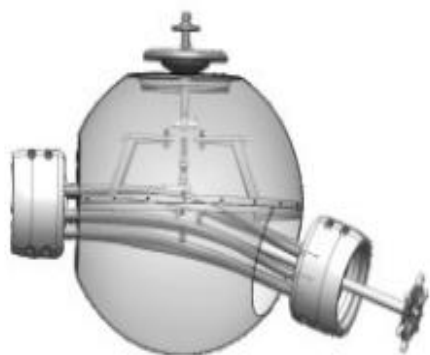


DC deicing circuit fittings



Converter station valve hall fittings

Valve hall fittings mainly include suspended-insulator suspension type fittings, insulator support type fittings, wall bushing type fittings, three-way tubular bus bar type fittings and valve tower type fittings.



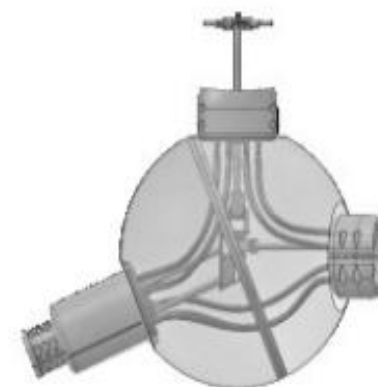
Suspended-type two-way tubular bus bar fittings



Support-type two-way tubular bus bar fittings (horizontal)



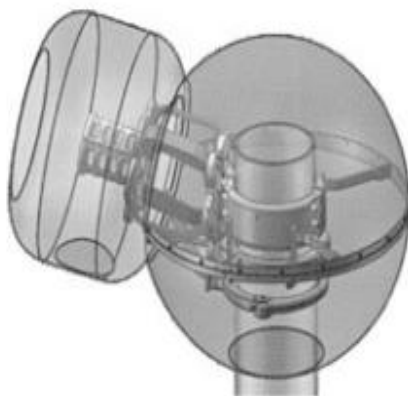
Support-type two-way tubular bus bar fittings (vertical)



Three-way tubular bus bar fittings



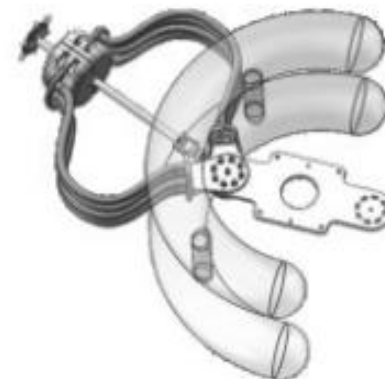
Three-way tubular bus bar fittings



Wall bushing fittings



Wall bushing fittings



Tubular bus bar connection fittings (sliding)



Tubular bus bar connection fittings
(fixed)



Tubular bus bar connection fittings
(sliding)



6-bundle spacers



Wiring board



Substation hardware

Substation hardware is mainly used for succession of down lead of tube bus bar and outlet terminal of electrical equipment (such as transformer, circuit breaker, isolating switch and mutual induct or of substation; substation hardware includes T-shape cable clamp, various equipment cable clamp of down lead and electrical equipment connection as well as expansion joint and transition plate connected by bus bar and equipment.



SY-A equipment cable clamp



T-type clamp



MRJ binary division spacer



Tubular bus bar connecting hardware



MJS tubular bus bar spacer



MGZ end ball



MGG fixed hardware



MGG1 sliding hardware



MGG2 fixed hardware



MGT-A T-connection hardware



MGT T-connection hardware



MGSP horizontal connecting hardware



MGXX1 cable-stayed suspension clamp



MGTY1-2 tubular bus bar connecting hardware



MGTS_{1/2} jumper clamp



MGS connecting hardware



MGGD-WP tubular bus bar connecting hardware



MGTJ tubular bus bar support hardware



Line hardware

Line hardware is used for connecting power transmission line pole tower, lead, lightning conductor and insulator or metal components protecting lead, lightning conductor and insulator. Based on the performance and usage, line hardware can be roughly divided in: suspension clamp, strain clamp, connection hardware, connecting hardware and protection hardware. Each hardware can be divided into various types based on hardware form, structure and construction method.



CGF suspension clamp (cast aluminum)



CGF-21040 suspension clamp (wrought aluminum)



CGF-21054 suspension clamp (wrought aluminum)



CGF-25047 suspension clamp (wrought aluminum)



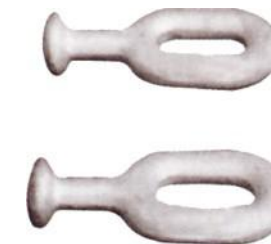
CGF-25060 suspension clamp (wrought aluminum)



Prestranded suspension clamp



U Hanging ring



QH ball hanging ring



W bowl head hanging board



WS bowl head hanging board



GD hanging board



LXV connection plate



LV8 coupling plate



FR shockproof hammer



FJZ binary division spacer



FJZ-380/440 tripartition spacer



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FJZ-400 cross spacer



FJZ-640/400 sixth division spacer



FJZ-840/500 eighty division spacer



DC ±800kV /L strain insulator-string



AC 1000kV T/L double tension string



AC 1000kV T/L strain insulator-string



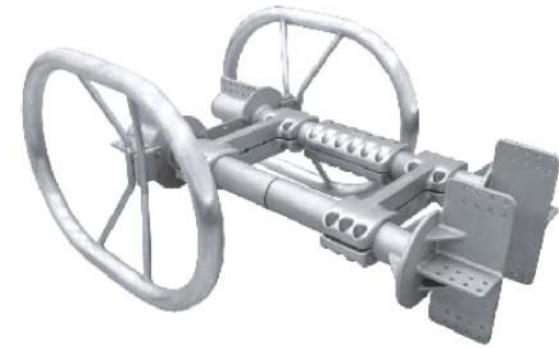
DC ±800kV T/L double "V"-shape hanging string



DC ±800kV T/L double "V"-shape hanging string



DC ±800kV T/L cage jumper string



DC ±800kV T/L aluminum tube jumper string



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Ability of Experimenting and Testing

Pingao Group has national enterprise technology center, mechanical industrial extra-high voltage engineering laboratory, mechanical industrial AC/DC high voltage electrical equipment engineering technical research center, Henan provincial high voltage electrical key laboratory, Henan provincial high voltage AC power transmission and distribution equipment engineering technical research enter, high voltage electrical equipment Henan engineering laboratory, sulfur hexafluoride Henan engineering laboratory, rubber plastic insulating sealing material Henan engineering laboratory and the only “high voltage switch equipment insulation material laboratory” in switch area of State Grid Company. It has strong advantages in high voltage electrical equipment, network distribution equipment and automation, insulation material and switch equipment manufacturing technique; in addition, it also has 3 professional test rooms,covering material shaping and thermal treatment, welding, surface engineering and other aspects.

The company provides strong technical support for high voltage electrical equipment technique research and power grid construction in China.



Test device for the leakage of electric current



Differential scanning calorimeter



Weather resistance tester



Ozone resistance tester



VICAT/hot deformation temperature tester



Specific surface area tester



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Brittle temperature tester



High/low temperature test chamber



Fourier transformation infrared spectrometer



Tension tester



Coating friction tester



X-ray thickness gauge



Coordinate measuring machine



Surface roughness tester



Ability of Experimenting and Testing

Pinggao Group has various test abilities of insulation test, mechanical test, loop resistance measurement, temperature rise test, short-time withstand current and peak withstand current test, closing and breaking test under short-circuit condition at outlet terminal, close-in fault test, out-of-step closing and breaking test, capacity current on-off test single-phase/out-phase grounding fault test.

The scope of product inspection includes high voltage AC circuit breaker, high voltage AC disconnecting switch and grounding switch, AC metal closing switch equipment and control equipment, gas insulating metal closing switch material, high voltage AC load switch, high voltage AC load switch - fuse combiner, 72.5kV and above AC load switch, AC automatic re-closer, AC automatic sectionalizer, high voltage/low voltage pre-installed substation, 3.6kV-40.5kV high voltage AC metal closed cable tap switch equipment, electric power fittings and other products.

Henan Provincial High Voltage Electrical Appliance Research Institute (subordinating unit of Pinggao Group Co., Ltd.) has passed qualification certification organized by the state at the end of 2014 and it has the capacity of power frequency withstand voltage test of 1100kV and below voltage grade switch equipment, lightning shock tolerance test, operating wave impact withstand test, measurement of partial discharge, long-term current temperature rise measurement, short-time / peak tolerance electric flooding test, mechanical performance test, sealing test, moisture measurement, rainproof test and research test; in addition, it can also develop capacity test of switch equipment at and below 363kV.



4800kV/480kJ impulse voltage generator



Short-circuit test transformer



Synthetic oscillation loop



1800kV/7200kVA power frequency test system



Combined immunity test equipment



Monitoring system and control platform



System loop analog screen



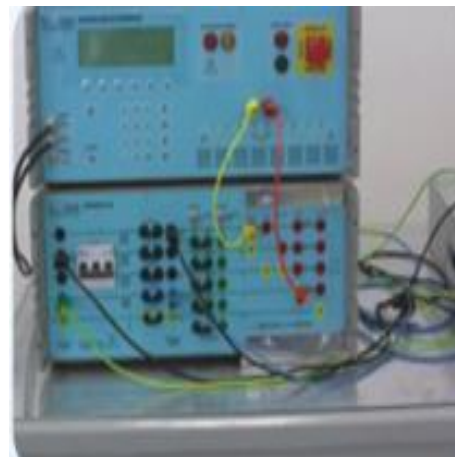
2500kVA temperature rise test system



Radiated, radio-frequency, electromagnetic field immunity test equipment



Immunity equipment of conducted disturbance induced by radio-frequency field



Surge immunity and pulsed magnetic field test equipment



Oscillatory wave and damping oscillatory magnetic field immunity test equipment



Corona and radio interference test



Temperature-rise test



Mechanical Operation Test



Mechanical load damage test

Sincere Service

As “Top 10 Service Star Enterprise of Power Equipment in China” and “National Contract Abidance and Credit Emphasis Unit”, Pinggao Group always insists on the marketing idea of “user center”. It hopes to win reputation from users with high effective, convenient and considerable service reputation while guaranteeing product quality.

Pinggao Group adheres to the service spirit of “making every effort with user satisfaction as purpose and constantly striving for perfection with continuous improvement as method”; it penetrates service idea in product design, manufacturing, installation, commissioning and maintenance process to improve user’s satisfaction so as to serve global users by standing in China.





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Project Performance



Zhongzhou converter station



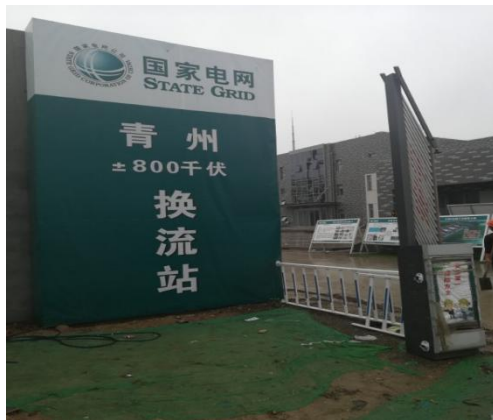
Zhongzhou converter station



Jinhua converter station



Jinhua converter station



Qingzhou converter station



Qingzhou converter station



Shaoshan converter station



Shaoshan converter station



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After the development in recent years, Pinggao Group Electric Power Fittings Company has undertaken the contracts of a number of converter station fittings, line fittings and transformation fittings, and has the full range of performance conditions of electric fittings. The main projects from domestic and overseas are as follows:



Major domestic performance

	Project Name	Voltage class	Category	Owner	Year
1	Zhengzhou Converter Station of Hami South-Zhengzhou $\pm 800\text{kV}$ Extra-High Voltage DC Power Transmission Project	$\pm 800\text{kV}$	Converter station hardware	State Grid Material Co., Ltd.	2013
2	Jinhua Converter Station of Left Bank of Xiluodu - Zhejiang Jinhua $\pm 800\text{kV}$ Extra-High Voltage DC Power Transmission Project	$\pm 800\text{kV}$	Converter station hardware	State Grid Material Co., Ltd.	2013
3	$\pm 800\text{kV}$ Fengxian Converter Station Joint Heating Renovation Project	$\pm 800\text{kV}$	Converter station hardware	Operation Branch Company, State Grid Company	2015
4	$\pm 800\text{kV}$ Yibin Converter Station Joint Heating Renovation Project	$\pm 800\text{kV}$	Converter station hardware	Operation Branch Company, State Grid Company	2015
5	$\pm 800\text{kV}$ Fulong Converter Station Joint Heating Renovation Project	$\pm 800\text{kV}$	Converter station hardware	Operation Branch Company, State Grid Company	2015
6	Lingzhou Converter Station of Lingzhou - Shaoxing $\pm 800\text{kV}$ Extra-High Voltage DC Power Transmission Project	$\pm 800\text{kV}$	Converter station hardware	State Grid Material Co., Ltd.	2015
7	$\pm 800\text{kV}$ Jinhua Converter Station of Wall Bushing Hardware Renovation Project	$\pm 800\text{kV}$	Converter station hardware	Shenyang Longxing Guotai Trading Co., Ltd.	2015
8	Taizhou Converter Station of Xiliguole League- Taizhou $\pm 800\text{kV}$ Extra-HV DC Power Transmission Project	$\pm 800\text{kV}$	Converter station hardware	Material Supply Company, Jiangsu Power Company	2016
9	Xiangtan Converter Station of Jiuquan -Xiangtan $\pm 800\text{kV}$ Extra-High Voltage DC Power Transmission Project	$\pm 800\text{kV}$	Converter station hardware	Hunan Provincial Power Company, State Grid	2016



10	Jiuquan Converter Station of Jiuquan -Xiangtan $\pm 800\text{kV}$ Extra-High Voltage DC Power Transmission Project	$\pm 800\text{kV}$	Converter station hardware	State Grid Corporation of China	2016
11	Linyi Converter Station of Shanghaimiao - Linyi $\pm 800\text{kV}$ Extra-High Voltage DC Power Transmission Project	$\pm 800\text{kV}$	Converter station hardware	Material Company, Shandong Provincial Power Company, State Grid	2016
12	$\pm 800\text{kV}$ Jiuquan Converter Station Valve Tower Hardware	$\pm 800\text{kV}$	Valve tower hardware	C-EPRI Electric Power Engineering Co., Ltd.	2016
13	Guquan Converter Station of Changji - Guquan $\pm 1100\text{kV}$ Extra-High Voltage DC Power Transmission Project	$\pm 1100\text{kV}$	Converter station hardware	Anhui Electric Power Company, SGCC	2016
14	Changji Converter Station of Changji - Guquan $\pm 1100\text{kV}$ Extra-High Voltage DC Power Transmission Project	$\pm 1100\text{kV}$	Converter station hardware	Material Company, Xinjiang Power Company, State Grid	2016
15	$\pm 800\text{kV}$ Zhongzhou Converter Station Hardware Renovation Project	$\pm 800\text{kV}$	Converter station hardware	Zhengzhou Management Department, State Grid Operation Branch Company	2016
16	Qingzhou Converter Station of Zhalute - Qingzhou $\pm 800\text{kV}$ Extra-High Voltage DC Power Transmission Project	$\pm 800\text{kV}$	Converter station hardware	Material Company, Shandong Provincial Power Company, State Grid	2016
17	$\pm 800\text{kV}$ Shanghaimiao - Linyi Converter Station High-end Valve Hall Valve Tower Hardware	$\pm 800\text{kV}$	Valve tower hardware	C-EPRI Electric Power Engineering Co., Ltd.	2016
18	$\pm 800\text{kV}$ Jinhua Converter Station Wall Bushing Hardware Renovation Project	$\pm 800\text{kV}$	Converter station hardware	Shenyang Longxing Guotai Trading Co., Ltd.	2016
19	$\pm 800\text{kV}$ Zhongzhou Converter Station Wall Bushing Hardware Renovation Project	$\pm 800\text{kV}$	Converter station hardware	Zhengzhou Management Department, State Grid Operation Branch Company	2016
20	$\pm 800\text{kV}$ Qingzhou Converter Station High-end Valve Hall Valve Tower Hardware	$\pm 800\text{kV}$	Valve tower hardware	C-EPRI Electric Power Engineering Co., Ltd.	2017



21	±800kV Yibin Converter Station Wall Bushing Hardware Renovation Project	±800kV	Converter station hardware	State Grid Company Operation Branch	2017
22	±800kV Jinping Converter Station Wall Bushing Hardware Renovation Project	±800kV	Converter station hardware	State Grid Company Operation Branch	2017
23	±800kV Fulong Converter Station Wall Bushing Hardware Renovation Project	±800kV	Converter station hardware	State Grid Company Operation Branch	2017
24	±800kV Ximeng Converter Station Valve Tower Hardware	±800kV	Converter station hardware	Xi'an Xibian Power System Co., Ltd.	2017
25	Zhalute-Qingzhou Extra-High Voltage DC Power Transmission Project ±800kV lead strain insulator-string procurement	±800kV	Line hardware	Material Company, Shandong Provincial Power Company, State Grid	2016
26	Changji - Guquan ±800kV Extra-High Voltage DC Power Transmission Project (Anhui Section)	±1100kV	Line hardware	Anhui Electric Power Company, SGCC	2017
27	Changji-Guquan ±1100kV Extra-High Voltage DC Power Transmission Project (Gan Section 9)	±1100kV	Line hardware	Anhui Electric Power Company, SGCC	2017
28	Dianxi North - Guangdong ±800kV Extra-High Voltage DC Power Transmission Project Xinshu Converter Station	±800kV	Valve tower hardware	XJ Group Corporation	2017
29	State Grid Ningxia Fangjiazhuang Power Plant 2×1000MW Set Engineering 750kV system hardware	750kV	Substation hardware	State Grid Zheneng Ningdong Power Generation Co., Ltd.	2017
30	Riyueshan and Chaidamu serial compensation project	750kV	Substation hardware	Changzhou Borui Power Automation Equipment Co., Ltd.	2017



31	Changji-Guquan $\pm 1100\text{kV}$ Extra-High Voltage DC Power Transmission Project Changji Converter Station	1000kV	Substation hardware	Shanghai Power Transmission and Transformation Engineering Co., Ltd.	2017
32	Changji-Guquan $\pm 1100\text{kV}$ Extra-High Voltage DC Power Transmission Project Guquan Converter Station	1000kV	Substation hardware	Heilongjiang Provincial Power Transmission and Transformation Engineering Co., Ltd.	2017
33	Changji-Guquan $\pm 1100\text{kV}$ Extra-High Voltage DC Power Transmission Project Guquan Converter Station	1000kV	Substation hardware	Liaoning Provincial Power Transmission and Transformation Engineering Co., Ltd.	2017



Major overseas performance

	Project Name	Voltage class	Category	Owner	Year
1	Brazil Beautiful Mountain ±800kV Valve Tower Hardware	±800kV	Valve tower hardware	Changzhou Borui Power Automation Equipment Co., Ltd.	2016
2	Brazil Beautiful Mountain ±800kV Extra-High Voltage DC Send-out Phase-II Project	±800kV	Converter station hardware and tubular bus bar	China Electric Power Equipment and Technology Co., Ltd.	2017
3	Laos 115kV Ban Houayxay - Dongpeng Line Project	115kV	Line hardware	Laos State Grid Company	2017
4	Laos 230kV Xekong 2 - Dakecheng Line Project	230kV	Line hardware	Laos State Grid Company	2017
5	Brazil GENTIO DO OURO Substation	500kV	Power transformation hardware and tubular bus bar	Changzhou Borui Power Automation Equipment Co., Ltd.	2017
6	Pakistan Mertiar - Rahar ±660kV DC Power Transmission Project	±660kV	Converter station hardware and power transmission hardware and tubular bus bar	China Electric Power Equipment and Technology Co., Ltd.	2017
7	Pakistan PESCO TENDER NO.1/PMU 1391 item /1504 item	132kV	Substation hardware	Pakistan Peshawar Power Company	2017
8	Pakistan ADB-TRANCE-MEPCO-05 LOT-I	132kV	Substation hardware	Pakistan Multan Power Company	2017



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Build a world-class power grid
And a world-class enterprise

