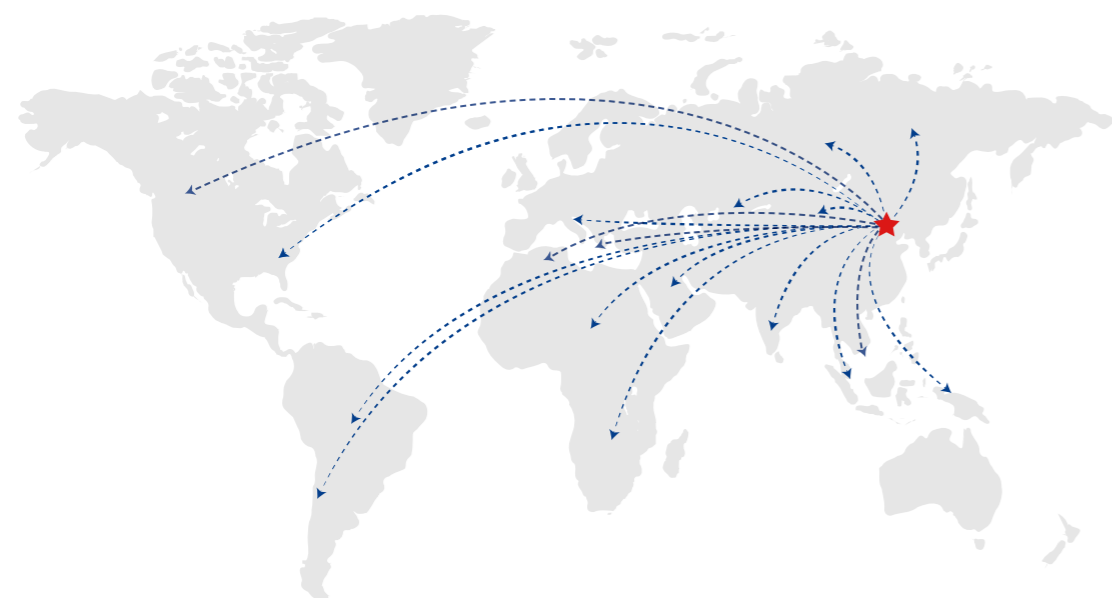




中文网站
Chinese website



英文网站
English website



BUSHING

博世因

博世因 (北京) 高压电气有限公司

BUSHING(BEIJING) HV ELECTRIC CO.,LTD

地 址: 北京市密云区经济开发区强云路 8 号

电子邮箱: boshiyinxsb@163.com

国内网址: www.boshiyin.com

国际网址: www.bushing-electric.com

电 话: 010-6907-0158

Add: No.8 Qiangyun Road, Economic Development Zone, Miyun District, Beijing

Email: boshiyinxsb@163.com

Domestic : www.boshiyin.com

International : www.bushing-electric.com

Tel: +86-10-6907-0158

Contents



公司介绍 Company Profile	02
荣誉资质 Honors and Qualifications	04
产学研校企合作 School Enterprise Cooperation	06
公司发展历程 Company Development History	08
产品介绍 Product Introduction	10

产品试验 Product Test	16
专项产品介绍 Special Product Introduction	20
主要业绩 Main Performance	30
合作伙伴 Company Partners	52



博世因(北京)高压电气有限公司位于北京密云经济开发区, 是一家致力于电力及能源装备制造领域的综合性企业。专业生产 1200kV 及以下胶浸纤维及胶浸纸干式电容型变压器套管、GIS 出线套管、油 /SF₆ 套管、油 / 油套管、大电流套管、箱变套管和穿墙套管等系列产品。

我公司产品广泛应用在百万机组燃煤电厂、千万千瓦级陆地风电 / 陆地光伏、近远海风电、燃气发电、石油化工、高铁牵引变、钢铁有色整流变等领域。并与中国国家电网、南方电网、五大六小发电集团、地方能源集团、施耐德、ABB、西门子、现代重工、阿尔斯通、国际能源集团等达成长期合作。

Bushing (Beijing)HV Electric Co., Ltd. is located in the Miyun Economic Development Zone of Beijing. It is a comprehensive company dedicated to the field of power and energy equipment manufacturing. We specialize in producing a series of products including 1200kV and below RIF/RIS and RIP dry-type condenser Transformer bushing, GIS bushing, Oil/SF₆ bushing, Oil/Oil bushing, High current bushing, Substation transformer bushing, and Wall bushing etc.

Our products are widely used in 1000MW level coal-fired power plants, 10000MW level onshore wind power, onshore photovoltaic power, offshore wind power, gas power generation, petrochemical industry, high-speed railway traction transformer, and rectification transformer etc. Our company has long-term cooperation with State Grid of China, China Southern Power Grid, five major and six subsidiary power generation groups and local energy groups of China and Schneider, ABB, Siemens, Hyundai Heavy Industries, Alstom and international energy groups.

不断创新, 追求卓越
WE INNOVATE, WE OUTSTANDING

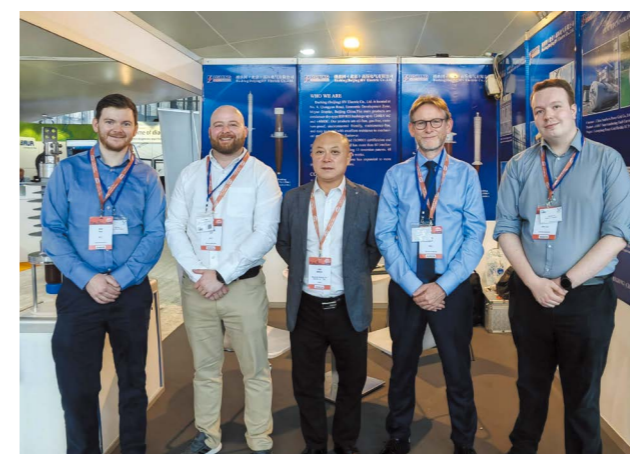


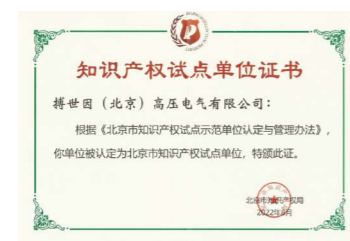
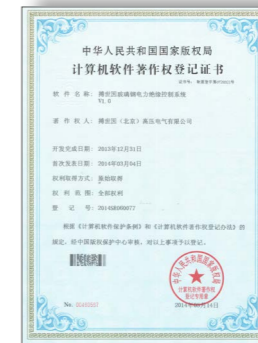
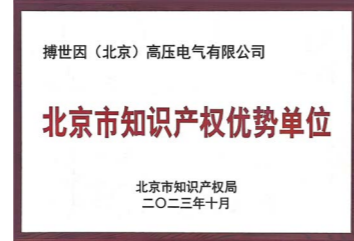
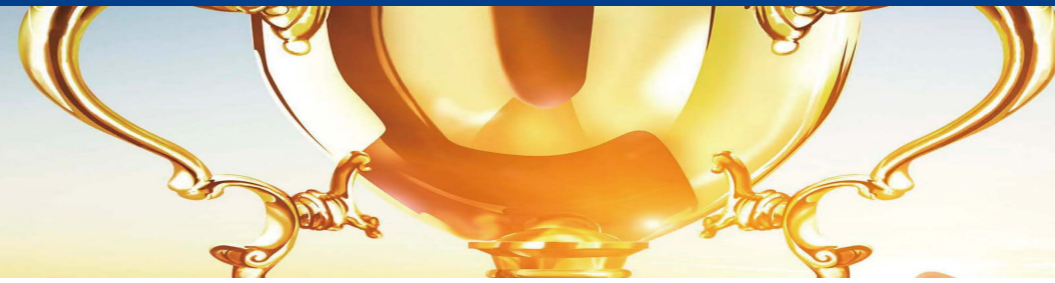
目前国际业务已拓展至俄罗斯、白俄罗斯、乌克兰、美国、加拿大、土耳其、埃及、阿尔及利亚、赞比亚、哈萨克斯坦、巴基斯坦、印度、印度尼西亚、马来西亚、古巴等 30 多个国家和地区。

运行更安全, 输送更高效, 管理更智能, 是博世因人一贯的追求, 不忘初心, 奋发前进, 为客户不断创造更大价值, 为中国高端智能化套管贡献力量。

Now days, our international business has expanded to more than 30 countries and regions, including Russia, Belarus, Ukraine, the United States, Canada, Turkey, Egypt, Algeria, Zambia, Kazakhstan, Pakistan, India, Indonesia, Malaysia, Cuba, etc.

Safer operation, more efficient transmission, and more intelligent management are the consistent pursuit of Bushing (Beijing). We will keep our original intention, work hard to create greater value for our customers, and contribute to China high-end intelligence bushing field.







华北电力大学 博世因公司
North China Electric Power University Bushing (Beijing) HV Electric Co., Ltd.

研究生工作站
Graduate Workstation



东北电力大学 博世因(北京)高压电气有限公司
Northeast Electric Power University Bushing (Beijing) HV Electric Co., Ltd.

研究生工作站
Graduate Workstation



特种绝缘材料
储能电池技术
Special insulation materials
Energy storage battery technology



抗震模拟仿真
产品结构设计
Seismic simulation
Product structure design



国家电网
STATE GRID

中国电力科学研究院有限公司
CHINA ELECTRIC POWER RESEARCH INSTITUTE

国产化材料
产品性能验证
Domestic materials
Product performance verification



电磁场仿真计算
新产品联合研制
Electromagnetic field simulation calculation
Joint development of new products

同时，公司与重庆大学电气工程学院、厦门理工大学电气与自动化学院、哈尔滨理工大学电气与电子工程学院、东北电力大学等保持长期有效交流和沟通。

At the same time, our company maintains long-term and effective communication and exchanges with Chongqing University, Xiamen University of Technology, Harbin Institute of Technology, Northeast Electric Power University.

研制成功世界第一支玻璃钢干式套管

The world's first RIF bushing was successfully developed.

2000

2013

成立搏世因（北京）高压电气有限公司

Establishment of Bushing (Beijing) HV Electric Co., Ltd.



第一批干式套管走出国门

The first batch of dry bushing went abroad

2016

第一支 550kV 干式变压器套管挂网运行

The first 550kV dry-type transformer bushing is running on the grid

公司与南方电网公司合作研发世界首台 ±160kV 直流超导限流器在南澳岛成功投运。

The company collaborated with China Southern Power Grid Corporation to develop the world's first ± 160kV DC superconducting current limiter, which was successfully put into operation on Nan'ao Island.

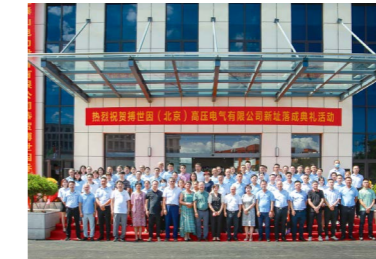
2020

公司被认定为北京市专精特新小巨人企业，工信部专精特新小巨人企业

The company has obtained the certifications of specialized and sophisticated enterprises that produce new and unique products ("little giant" enterprises) granted both by Beijing municipal government and Ministry of Industry and Information Technology.

在北京密云购置并建立第二生产制造基地

Purchased and established the second manufacturing base in Miyun, Beijing



2021

在北京密云购置并筹建第三生产制造基地

Purchase and build the third manufacturing base in Miyun, Beijing

2024

研制成功我国首条三相同轴超导电缆出线套管并在深圳投入运行

Our company successfully developed China's first triaxial superconducting cable outlet bushing and put into operation in Shenzhen.

BUSHING

PRODUCTS



变压器套管
 额定电压 (Um):
 12kV~1200kV
 ±12kV~±1200kV
 额定电流:
 630A~8000A

Transformer Bushing
 Voltage(Um) :
 12kV~1200kV
 ±12kV~±1200kV
 Current :
 630A~8000A



GIS 出线套管
 额定电压 (Um):
 40.5kV~1100kV
 额定电流:
 630A~8000A

GIS Bushing
 Voltage(Um) :
 40.5kV~1100kV
 Current :
 630A~8000A



油 /SF₆ 套管
 额定电压 (Um):
 40.5kV~800kV
 额定电流:
 630A~5000A

Oil/SF₆ Bushing
 Voltage(Um) :
 40.5kV~800kV
 Current :
 630A~5000A



油 / 油套管
 额定电压 (Um):
 72.5kV~800kV
 额定电流:
 630A~4000A

Oil/Oil Bushing
 Voltage(Um) :
 72.5kV~800kV
 Current :
 630A~4000A



断路器套管
 额定电压 (Um):
 24kV~1100kV
 额定电流:
 630A~8000A

Circuit Breaker Bushing
 Voltage (Um):
 24kV~1100kV
 Current :
 630A~8000A



换流变套管
 额定电压 (Um):
 ±200kV~±800kV
 额定电流:
 6350A

Converter Transformer Bushing
 Voltage(Um) :
 ±200kV~±800kV
 Current :
 6350A



穿墙套管
 额定电压 (Um):
 12kV~1200kV
 ±12kV~±1200kV
 额定电流:
 630A~8000A

Wall Bushing
 Voltage(Um) :
 12kV~1200kV
 ±12kV~±1200kV
 Current :
 630A~8000A



大电流套管
 额定电压 (Um):
 12kV~40.5kV
 额定电流:
 10000A~40000A

High Current Bushing
 Voltage(Um) :
 12kV~40.5kV
 Current :
 10000A~40000A



箱变套管
 额定电压 (Um):
 40.5kV
 额定电流:
 1A~630A

Prefabricated Substation Transformer Bushing
 Voltage(Um) :
 40.5kV
 Current :
 1A~630A

RIF/RIS

Resin Impregnated Fiber/Synthetic

胶浸纤维 (RIF/RIS) 干式电容型套管

采用高绝缘性能玻璃纤维浸渍超低粘度耐高温环氧树脂，微机自动控制缠绕设备按测地线交叉叠加制成电容芯子绝缘层。连接法兰由高强度铝合金制成，与电容芯子胶装成一体。外绝缘由硅橡胶增爬伞裙或瓷绝缘子与法兰密封固定。中间导体载流采用穿缆方式或导杆方式。

基于特种的力学铺层设计，具备优异的机械强度，能够应对复杂的运行环境。具备优异的抗冲击能力及地震耐受能力，水平加速度 0.76g，垂直加速度 0.62g，远远超过 9 级地震烈度 0.4g 的要求。

RIF/RIS Dry-type Condenser Bushing

High insulation performance glass fiber impregnated with epoxy resin, and the winding process is automatically controlled by microcomputer to produce the insulation by crossing stacking according to geodesic. The flange is made of high-strength aluminum alloy and cemented together with the condenser core. The external insulation is sealed and fixed by the silicone rubber shed or porcelain insulator with the flange. The current-carrying conductor selects draw lead or fixed solid bottom connected.

Based on the special mechanical paving design, our products have excellent mechanical strength, can handle with complex operating environment. With excellent impact resistance and seismic tolerance, the product can withstand the impact of horizontal acceleration of 0.76g and vertical acceleration of 0.62g, which obviously exceeds the requirement of 0.4g for magnitude 9 earthquake.



产品型号 Product Type

Product Type	Chinese Description	English Description
F	额定电流 (A)	Rated current(A)
E	额定电压 (kV)	Rated voltage(kV)
B	预留 CT 安装位置 (不带 CT 则无)	Reserved CT installation position (without if there is no CT)
R	加强型	Enhanced type
W	电容型 (非电容型则无)	Condenser type non-condenser type without
L	变压器 (电抗器) 套管	Transformer/Reactor Bushing
***	环氧树脂浸渍纤维 (RIS/RIF)	Resin impregnated fiber(RIS/RIF)
****	复合外绝缘 (瓷外绝缘则无)	Composite(Not required for Porcelain)
B	变压器 (电抗器) 套管	Transformer/Reactor Bushing
C	穿墙套管	Wall Bushing
O	油 / 油套管	Oil/Oil Bushing
OG	油 /SF ₆ 套管	Oil/SF ₆ Bushing
G	GIS 出线套管	GIS Bushing
D	断路器套管	Circuit breaker Bushing
L	可装电流互感器	Can be installed
-	不可装电流互感器	Cannot be installed
Um	额定电压千伏数 (kV)	Rated voltage kilovolts(kV)
Ir	额定电流安培数 (A)	Rated current amperes(A)

例：复合外绝缘 252kV/1250A 的变压器套管，可装设电流互感器，其型号为 :FEBRWL-252/1250

Example:252kV/1250A transformer bushing with composite outer insulator, can be assembled with current transformer, type:FEBRWL-252/1250

产品范围 Product Range

(变压器 / 电抗器套管)Transformer/Reactor Bushing
Um:12kV-1200kV Ir:630A-8000A

(大电流套管)High Current Bushing
Um:12kV-40.5kV Ir:10000A-40000A

(油 / 油套管)Oil/Oil Bushing
Um:72.5kV-800kV Ir:630A-4000A

(油 /SF₆ 套管)Oil/SF₆ Bushing
Um:40.5kV-800kV Ir:630A-5000A

(GIS 套管)GIS Bushing
Um:40.5kV-1100kV Ir:630A-8000A

(穿墙套管)Wall Bushing
Um:12kV-1200kV Ir:630A-8000A



Resin Impregnated Paper

胶浸纸 (RIP) 干式电容型套管

胶浸纸干式电容型套管 (RIP): 胶浸纸干式电容型套管的主绝缘是胶浸纸电容芯子, 按照电场设计要求, 卷制皱纹纸并铺设铝箔电容屏形成串联电容分压结构的电容芯子, 经过真空干燥后进行环氧树脂混合料的真空浸渍, 浸渍后高温固化成型, 并机加成目标尺寸。

RIP Dry-type Condenser Bushing

The insulation is wound with crepe paper and aluminum foil. According to the design of the electric field, crepe paper and aluminum foil are wound alternately to produce the series capacitor voltage distribution structure. The insulation is dried under vacuum and impregnated by epoxy resin. After impregnation, it is cured at high temperature and machined to the target size.

产品范围 Product Range

(变压器 / 电抗器套管)Transformer/Reactor Bushing

Um:12kV-1200kV Ir:630A-8000A

(大电流套管)High Current Bushing

Um:12kV-40.5kV Ir:10000A-40000A

(油 / 油套管)Oil/Oil Bushing

Um:72.5kV-800kV Ir:630A-4000A

(油 / SF₆ 套管)Oil/SF₆ Bushing

Um:40.5kV-800kV Ir:630A-5000A

(GIS 套管)GIS Bushing

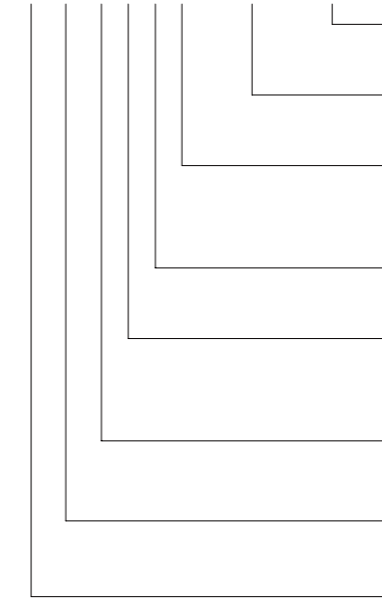
Um:40.5kV-1100kV Ir:630A-8000A

(穿墙套管)Wall Bushing

Um:12kV-1200kV Ir:630A-8000A

产品型号 Product Type

F P B R W L - * * * / * * * *



额定电流 (A)
Rated current(A)

额定电压 (kV)
Rated voltage(kV)

预留 CT 安装位置 (不带 CT 则无)
Reserved CT installation position
(without if there is no CT)

加强型
Enhanced type

电容型 (非电容型则无)
Condenser type
non-condenser type without

变压器 (电抗器) 套管
Transformer/Reactor Bushing

环氧树脂浸渍皱纹纸 (RIP)
Resin impregnated paper(RIP)

复合外绝缘 (瓷外绝缘则无)
Composite(Not required for Porcelain)

变压器 (电抗器) 套管
B: Transformer/Reactor Bushing

穿墙套管
C: Wall Bushing

油 / 油套管
O: Oil/Oil Bushing

油 / SF₆ 套管
OG: Oil/SF₆ Bushing

GIS 出线套管
G: GIS Bushing

断路器套管
D: Circuit breaker Bushing

结构特征: 可否装电流互感器 :L- 可装; 不可装设时不表示
Structural features: Whether the current transformer can be installed: L-can be installed; it does not indicate when it cannot be installed:

特征数字: 额定电压千伏数 (kV) 额定电流安培数 (A)
Characteristic number; rated voltage kilovolts(kV) rated current amperes(A)

例: 复合外绝缘 252kV/1250A 的变压器套管, 可装设电流互感器, 其型号为 :FPBRWL-252/1250

Example: 252kV/1250A transformer bushing with composite outer insulator, can be assembled with current transformer, type: FPBRWL-252/1250





550kV 穿墙套管出厂试验
Routine test of 550kV wall bushing



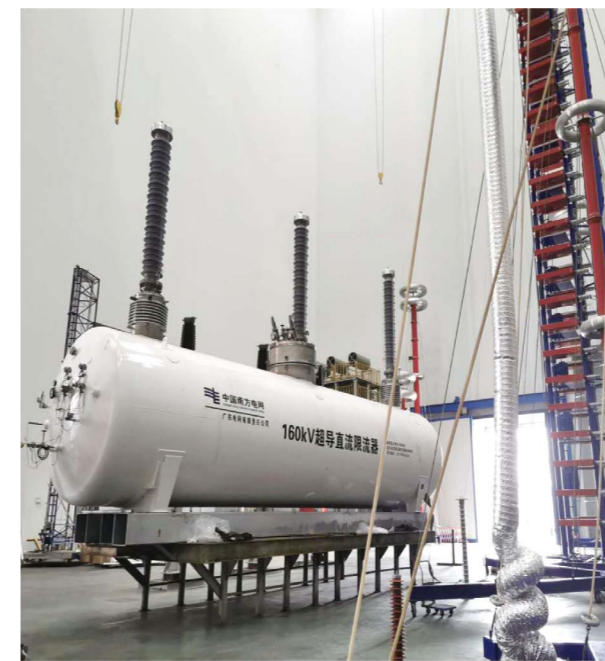
550kV 变压器套管安装在变压器上进行出厂试验
Installation of 550kV transformer bushing on the transformer for Routine test



±500kV GIS 出线套管出厂试验
Routine test of ±500kV GIS bushing



变压器套管出厂试验
Routine test of transformer bushing



±160kV 直流套管随超导直流限流器试验
Routine test of ± 160kV DC bushing with Resistive-type Superconducting Fault Current Limiter



-196°C ~ 室温环境 12 次冷热冲击试验
12 times cold and hot impact tests from -196 °C to room temperature

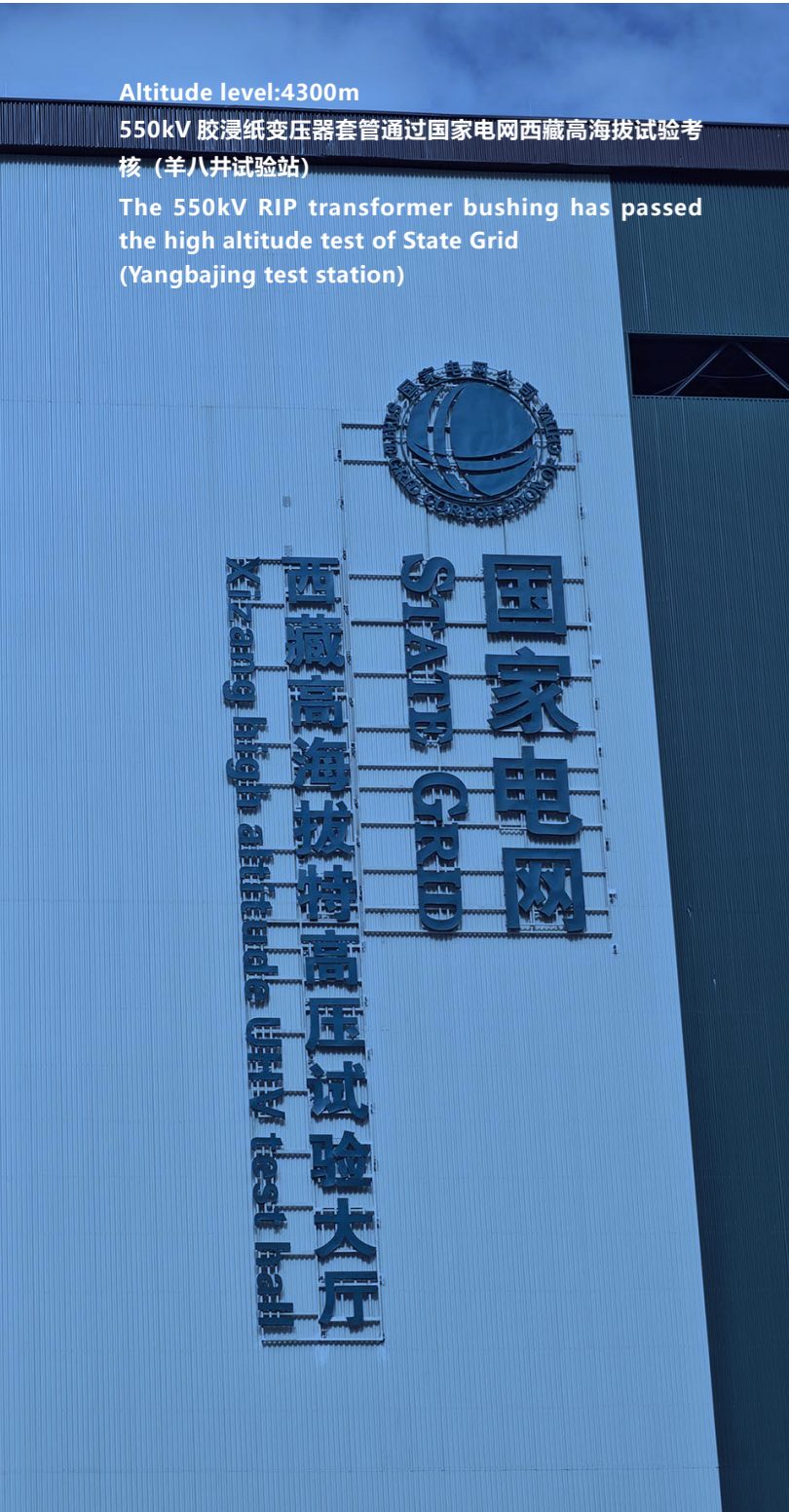


252kV 变压器套管通过了 0.76g 水平加速度、0.62g 垂直加速度的正弦共振拍波地震考核试验
The 252kV transformer bushing passed the sine resonance beat wave seismic assessment test with 0.76g horizontal acceleration and 0.62g vertical acceleration

Altitude level:4300m

550kV 胶浸纸变压器套管通过国家电网西藏高海拔试验考核 (羊八井试验站)

The 550kV RIP transformer bushing has passed the high altitude test of State Grid (Yangbajing test station)



箱变套管

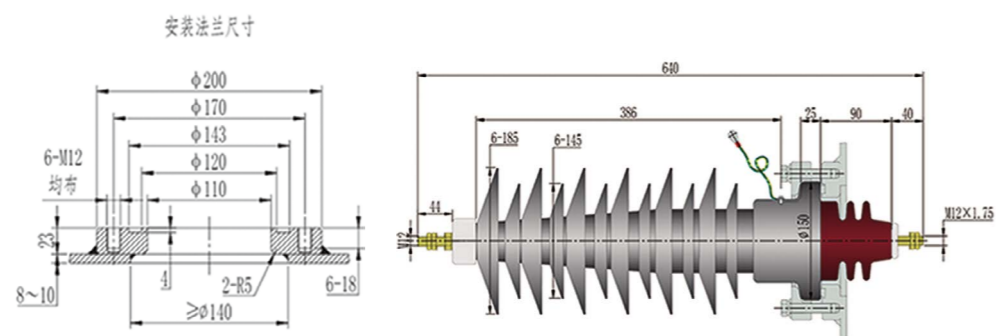
搏世因（北京）高压电气有限公司针对于新能源发电特性和地域影响，开发出的高强度复合电容型箱变专用套管其特点为：

- ① 采用绝缘材料和金属材料的线性膨胀系数基本一致，机械强度高。
- ② 采用特殊工艺避免绝缘材料和导体分离，根治了运行时渗漏油的情况。
- ③ 采用电容式分压结构，有效保证了产品在恶劣环境中较强的抗污闪能力和较高的电气绝缘裕度。
- ④ 本产品是传统纯瓷套管和环氧树脂浇注式箱变套管的理想替代产品。

Prefabricated Substation Transformer Bushing

Bushing (Beijing) HV Electric Co., Ltd. specializes in the field of new energy power generation and has developed high-strength composite prefabricated substation transformer bushing based on its regional characteristics. Its advantages are as follows:

- ① The linear expansion coefficients of insulation materials and metal materials are highly similar, and the mechanical strength is high.
- ② Special processes are used to avoid the separation of insulation materials and conductors, effectively eliminating oil leakage during operation.
- ③ By adopting a capacitive voltage divider structure, the product effectively ensures strong anti pollution flashover performance and high electrical insulation margin in complex environments.
- ④ This product is an ideal replacement for traditional pure porcelain bushing and epoxy resin cast prefabricated substation transformer bushing.



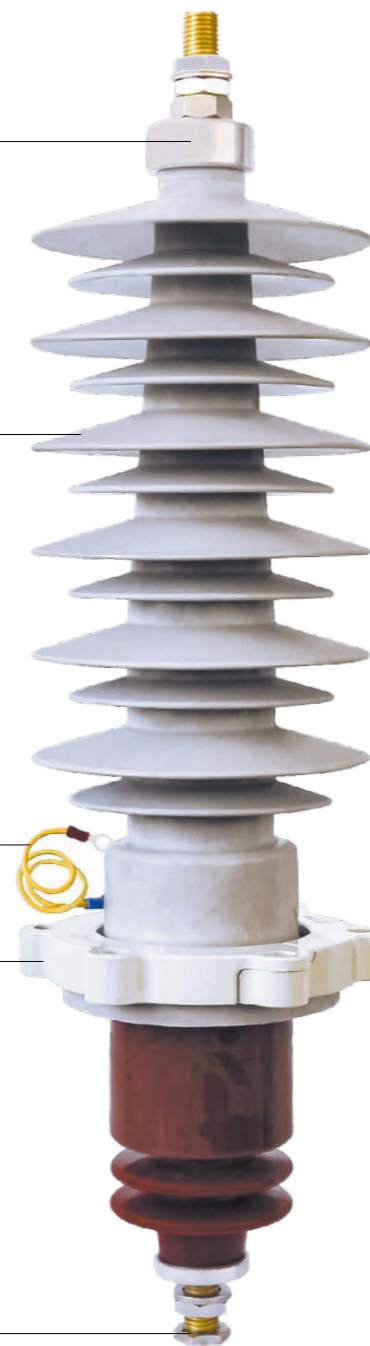
均压罩
Grading shield

硅橡胶增爬伞裙
Composite Sheds

接地线
Ground Wire

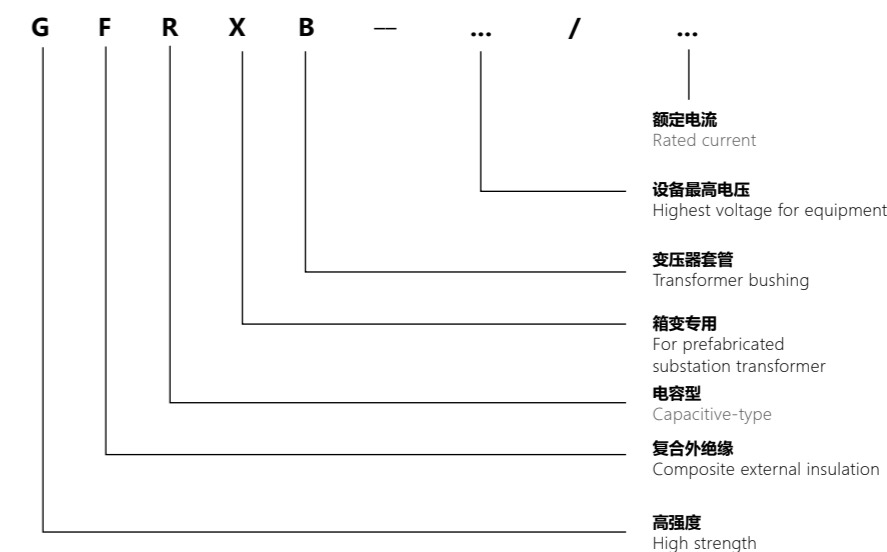
铝合金法兰
Aluminum Alloy Flange

接线柱
Connection Terminal



型号 (Type)	接线柱直径 (Connection String Diameter)
	D
GFRXB-40.5/100-315	M12
GFRXB-40.5/400-630	M20

型号说明 Demonstration of The Type



主要参数 Major parameters

技术标准	Technical standards	GB/T4109-2022
设备最高电压	Highest voltage for equipment	40.5kV
额定电流	Rated current	1A-630A
1 min 工频耐受电压	1 min power frequency voltage withstand	95(80)kV
雷电冲击耐受电压	Lightning impulse withstand voltage	200kV
介质损耗角正切值	Dielectric loss tan δ	0.005
局部放电量	Partial discharge	10 pC
抗弯负荷	Cantilever load	1000N
公称爬电距离	Creepage distance	31 mm/kV

穿墙 GIS

该产品适用于户内式 GIS 变电站出线，产品兼具穿墙套管（穿墙 GIS 壳体）及 GIS 套管两种功能，变电站户外部分没有 SF₆ 气体，GIS 运行不受环境温度变化影响，方便变电站的监测与维护。

特点：

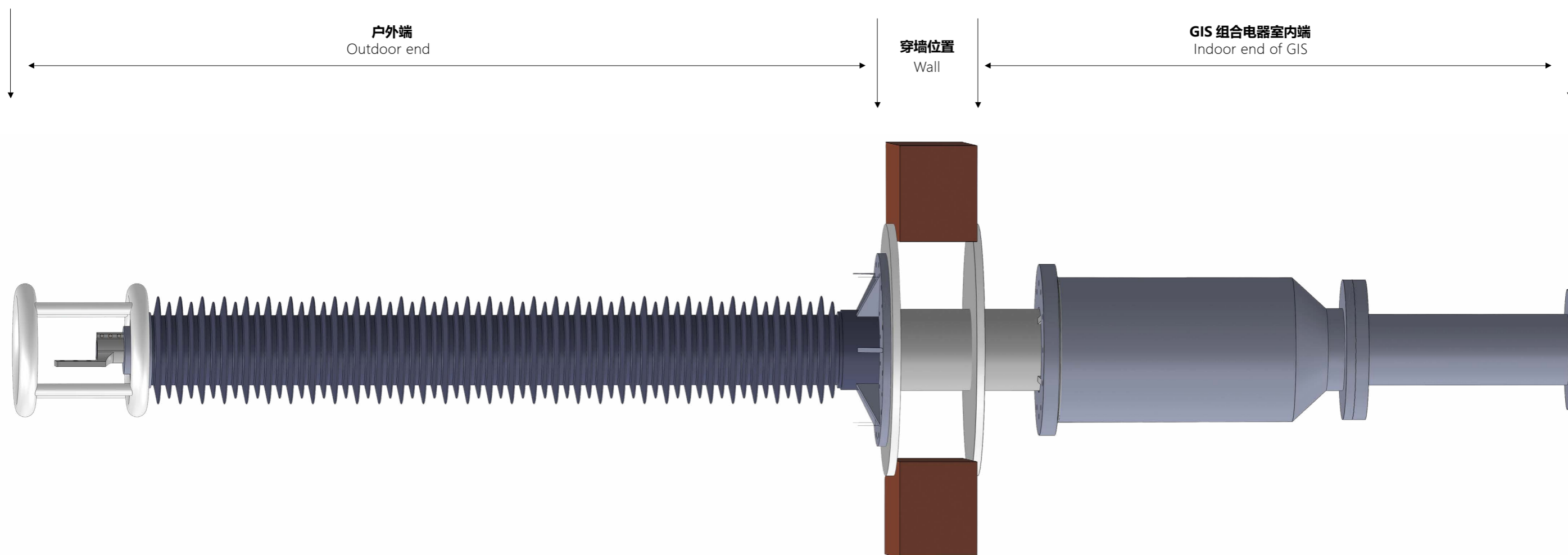
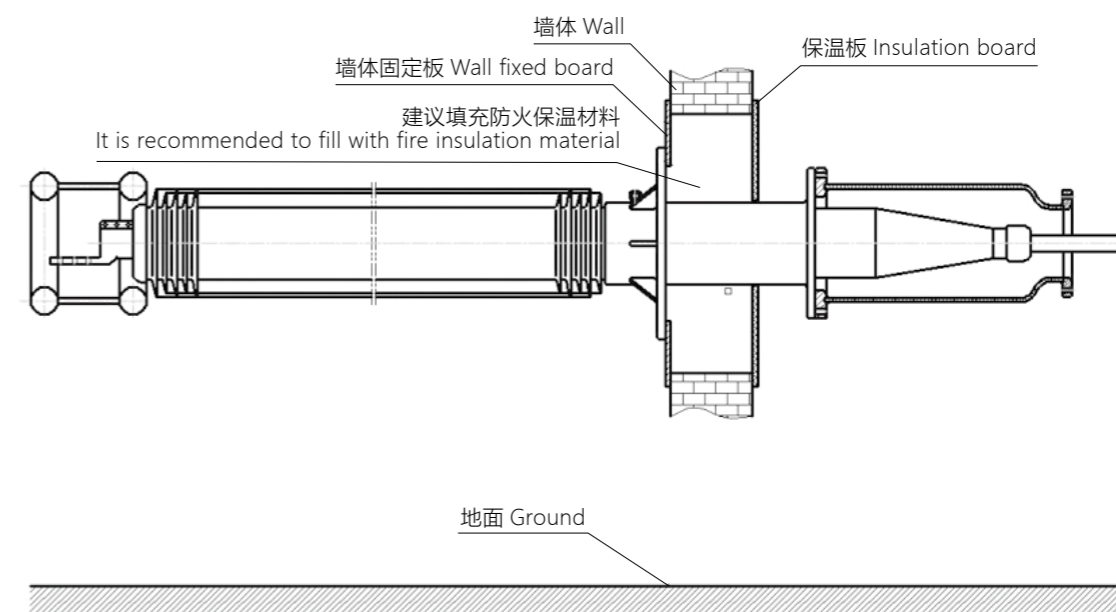
1. 结构简单，SF₆ 壳体部分全部在室内，不需要支架（穿墙套管、绝缘子）等设备，设备及材料成本低；节约空间，节省基建成本。
2. GIS 套管穿墙体进行连接，户外部分无 SF₆ 气体；寒冷地区不需要进行监控、保温等措施，维护成本低。

Through wall GIS

The product is suitable for the indoor GIS substation. The product has two functions of wall bushing (wall GIS shell) and GIS bushing. The outdoor part of the substation has no SF₆ gas, and GIS operation is not affected by environmental temperature changes, which facilitates the monitoring and maintenance of the substation.

Characteristic:

1. Simple structure, SF₆ part is all indoor, no support (through wall bushing, insulator) and other equipment, low equipment and material cost; save space and infrastructure cost.
2. The GIS bushing is connected through the wall, and the outdoor part is free of SF₆ gas; monitoring and insulation measures are not needed in cold areas, and the maintenance cost is low.



容性套管全方位智能实时感知系统

套管智能在线监测系统是博世因（北京）高压电气有限公司总结多年套管测量的现场处理经验，采用最新传感器技术、信号处理器、计算机等技术手段和算法实现的新一代高性能数字化套管智能在线监测系统。实现对套管介损、电容量、泄漏电流、局部放电参数选择性实时准确测量与计算，并具有本地显示、后台数据监控及远程监控等多种功能。

系统概述 System Overview

智能传感器 Intelligent Sensor



智能传感器安装于套管末屏上，用于测量基础信息；
The intelligent sensor is installed on the bushing end screen for measuring basic information;

处理单元 Processing Unit



安装于现场变压器等设备附近，对提取信号进行处理分析；
It is installed near the onsite transformer and other equipment to process and analyze the extracted signal;

交互后台 Interactive Back Console



数据传到站内后台进行实时监控，依据场景搭建；
Equip equipment according to the actual situation and data is transmitted to the back console of the substation for real-time monitoring ;

集控中心 Centralized Control Center



数据传到集控中心进行实时监控，依据场景搭建；
Equip equipment according to the actual situation and data is transmitted to the centralized control center for real-time monitoring ;

Capacitive Bushing Comprehensive Intelligent Real-time Monitoring System

Capacitive Bushing Comprehensive Intelligent Real-time Monitoring System for Condenser Bushing is a new generation of high-performance digital bushing online monitoring system manufactured by Bushing (Beijing) company, which has summarized years of on-site processing experience in transformer bushing measurement and adopted the latest sensor technology, signal processor, computer and other technical means. Our product has the function of selectively and accurately online measuring the dielectric loss, capacitance, leakage current, and partial discharge parameters of the bushing , and has local display, back console data monitoring, and remote monitoring.

应用案例 Application



超导套管

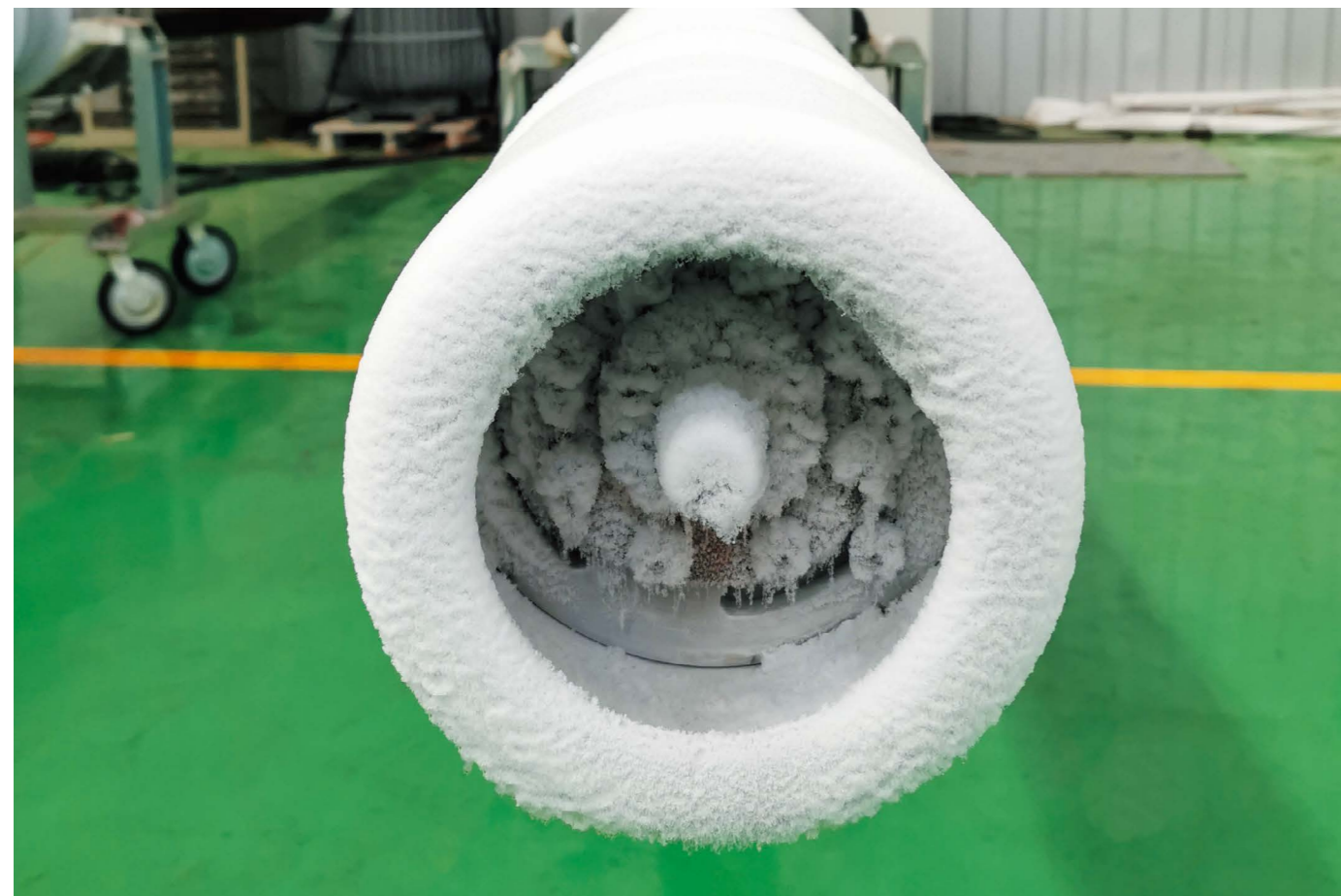
南澳岛是风力资源“富矿”，为了让耸立在岛上的 200 多台风机发出的绿色风能顺利接入电网，进而发挥其最大价值。早在 2013 年，世界上第一个多端柔性直流输电工程——南澳 ±160 千伏多端柔性直流输电示范工程就投运于此。项目投产后，随着越来越多的风能并网，这个超级工程需要应对的故障电流也随之增大。为保障电网的安全运行，超导直流限流器应运而生。

超导直流限流器的研制历时三年，实现了 100% 自主研发，形成了超过 70 个发明专利。其中搏世因公司的“高耐压跨温区高压套管”更是其中的创新技术亮点之一：

在如下的温度变化试验中，我公司设计研发的胶浸纤维套管仍能保证电气性能稳定。

1. 温度变化：-196℃ ~ +20℃；
2. 一个循环为：低温 -196℃ 下 15 小时，尽快回温（1 小时完成），在常温下 8 小时，24 小时为 1 个循环；
3. 套管连续经受 12 个冷热循环；

搏世因助力中国夺取超导电力装备制造应用的全球制高点！



Superconducting Bushing

Nan'ao Island has abundant wind resources. As early as 2013, the world's first multi terminal flexible DC transmission project, the Nan'ao Island ±160kV multi terminal flexible DC transmission demonstration project, was put into operation here. After the project is put into operation, as more and more wind power plant is connected to the power grid, the fault current that needs to be dealt with also increases. To ensure the safe operation of the power grid, superconducting DC current limiters have emerged.

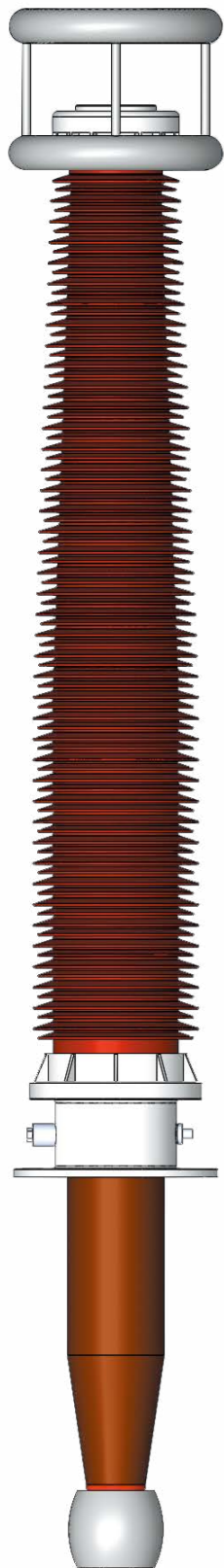
The development of superconducting DC current limiter took three years and achieved 100% independent research and development, resulting in over 70 invention patents. The "High Pressure Cross Temperature Zone High Voltage Bushing" developed by Bushing (Beijing) company is one of the highlight innovative technologies.

In the following temperature change test, the resin impregnated fiber bushing (RIF) designed and developed by our company can still ensure the bushing's stability of electrical performance:

1. Temperature change: -196℃ ~ +20℃；
2. One cycle is: at a low temperature of -196℃ for 15 hours, recover to room temperature as soon as possible (completed in 1 hour), at room temperature for 8 hours, and 24 hours are one cycle;
3. The bushing shall withstand 12 consecutive cold and hot cycles;

Bushing (Beijing) HV Electric Co., Ltd. helps China seize the global high ground in the manufacturing and application of superconducting power equipment!



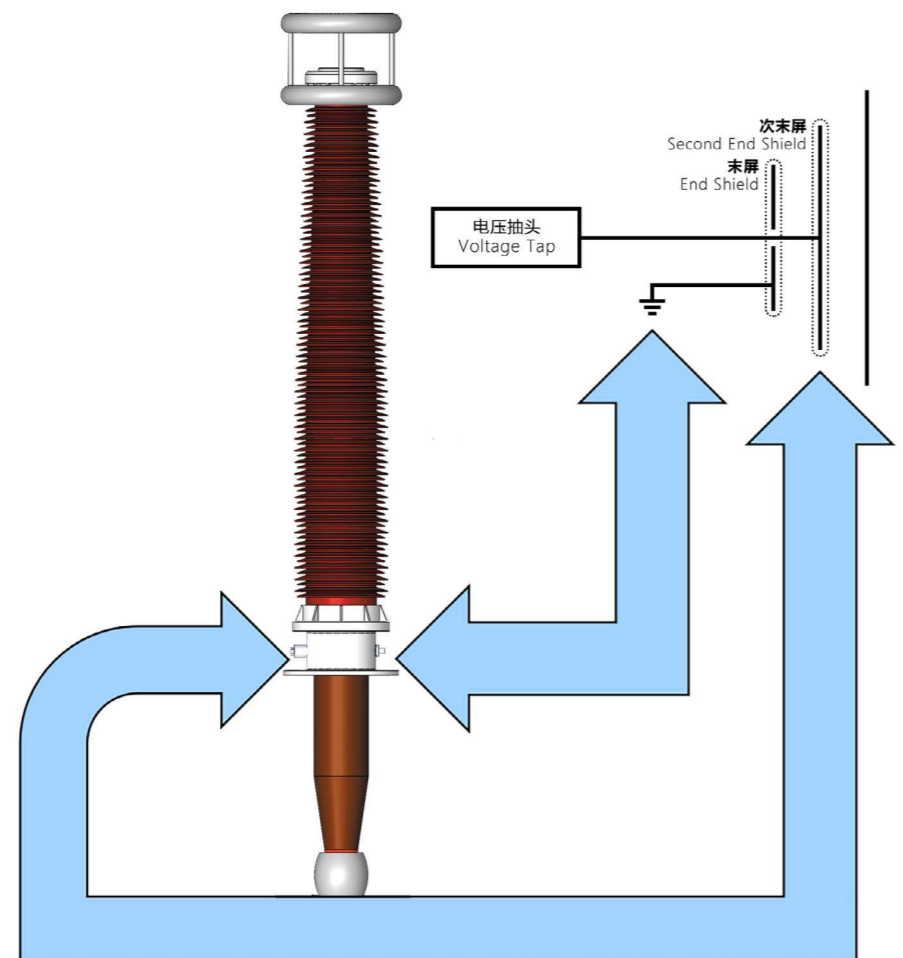


电压抽头干式电容型套管

干式电容型套管附带电压抽头，末屏附带测试抽头，次末屏附带电压抽头；电压抽头主要加装传感器，实现在线监测功能。

Dry-type Condenser Bushing With Voltage Tap

This type of Dry-type Condenser Bushing have a unique voltage tap. The end screen is equipped with test tap and the secondary end screen is equipped with voltage tap. The voltage tap is equipped with sensors to achieve online monitoring function.



试验抽头、电压抽头绝缘试验（对地工频耐受电压）

试验抽头施加电压： 3kV

持续时间： 60s

电压抽头施加电压： 10kV

持续时间： 60s

套管试验后，测试试验抽头及电压抽头介质损耗因数（ $\tan\delta$ ）和对地电容，测试电压为 2kV。

Test tap, voltage tap insulation test (Power-frequency withstand voltage to ground)

Test tap applied voltage: 3kV

Duration: 60s

Voltage tap applied voltage: 10kV

Duration: 60s

After the bushing test, test the dielectric loss factor ($\tan\delta$) and ground capacitance of the test tap and voltage tap, with a test voltage of 2kV.



百万机组 MILLION UNITS



国华广东清远 2×1000MW 机组

用户名称: 河南平高电气股份有限公司
产品名称: 550kV 干式电容型 GIS 套管
运行时间: 2023 年 12 月

Guohua Guangdong Qingyuan 2×1000MW Power Plant

Customer: Henan Pinggao Electric Co., Ltd
Product: 550kV Condenser Dry-type GIS Bushing
Operation Date: December 2023



山西国际能源孟县电厂 2×1000MW 机组

用户名称: 西安西电开关电气有限公司
产品名称: 550kV 干式电容型 GIS 套管
运行时间: 2021 年 9 月

Shanxi International Energy Yuxian 2×1000MW Power Plant

Customer: Xi'an XD Switchgear Electric Co., Ltd
Product: 550kV Condenser Dry-type GIS Bushing
Operation Date: September 2021



国华湖南岳阳 2×1000MW 机组

用户名称: 河南平高电气股份有限公司
产品名称: 550kV 干式电容型 GIS 套管
运行时间: 2023 年 5 月

Guohua Hunan Yueyang 2×1000MW Power Plant

Customer: Henan Pinggao Electric Co., Ltd
Product: 550kV Condenser Dry-type GIS Bushing
Operation Date: May 2023



山西中电神头第二发电有限责任公司 二期 2×1000MW 机组

用户名称: 特变电工衡阳变压器有限公司
产品名称: 550kV 干式电容型变压器套管
运行时间: 2021 年 4 月

Shanxi Zhongdian Shentou Second Power Generation Co., LTD. 2×1000MW Power Plant

Customer: TBEA Hengyang Transformer Co., Ltd
Product: 550kV Condenser Dry-type Transformer Bushing
Operation Date: April 2021

水电项目 HYDROPOWER



叶巴滩水电站

用户名称: 西安西电变压器有限责任公司
产品名称: 550kV 干式电容型油/SF₆ 套管
计划运行时间: 2025 年底

Yebatan Hydropower Station

Customer: Xi'an XD Transformer Co., Ltd
Product: 550kV Condenser Dry-type oil/SF₆ Bushing
Planned Operation Date: at the end of 2025



河南五岳抽水蓄能电站

用户名称: 山东电力设备有限公司
产品名称: 550kV 干式电容型油/SF₆ 套管
计划运行时间: 2026 年

Henan Wuyue Pumped storage power station

Customer: Shandong Electric Power Equipment Co., Ltd
Product: 550kV Condenser Dry-type oil/SF₆ Bushing
Planned Operation Date: 2026

高铁 HIGH SPEED RAILWAY



时速: 350km/h

郑渝高铁 - 郑万段项目

用户名称: 云南变压器电气股份有限公司
产品名称: 252kV 干式电容型变压器套管
运行时间: 2018年12月

Speed: 350km/h

Zhengzhou - Chongqing high-speed railway project

Customer: Yunnan Transformer Electric Co., Ltd
Product: 252kV Condenser Dry-type Transformer Bushing
Operation Date: December 2018



时速: 350km/h

南昌铁路局南昌 - 赣州高铁项目

用户名称: 云南变压器电气股份有限公司
产品名称: 252kV 干式电容型变压器套管 - 在线监测系统
运行时间: 2019年6月

Speed: 350km/h

Nanchang-Ganzhou high-speed railway project

Customer: Yunnan Transformer Electric Co., Ltd
Product: 252kV Condenser Dry-type Transformer Bushing with Online Monitoring System
Operation Date: June 2019



时速: 350km/h

西安至延安高铁项目

用户名称: 特变电工股份有限公司新疆变压器厂
产品名称: 363kV 干式电容型变压器套管
安装时间: 2024年10月

Speed: 350km/h

Xi 'an to Yan' an high-speed railway project

Customer: TBEA Xinjiang Transformer Co., Ltd
Product: 363kV Condenser Dry-type Transformer Bushing
Installation Date: October 2024



时速: 250km/h

兰州铁路局吴忠 - 中卫高铁项目

用户名称: 卧龙电气银川变压器有限公司
产品名称: 363kV 干式电容型变压器套管
运行时间: 2017年10月

Speed: 250km/h

Wuzhong-Zhongwei high-speed railway project

Customer: Wolong Electric Yinchuan Transformer Co., Ltd
Product: 363kV Condenser Dry-type Transformer Bushing
Operation Date: October 2017

高铁 HIGH SPEED RAILWAY



时速: 250km/h
海拔: 3000m

兰州铁路局兰州 - 张掖高铁项目

用户名称: 特变电工股份有限公司新疆变压器厂
产品名称: 363kV 干式电容型变压器套管
运行时间: 2024 年 6 月

Speed: 250km/h
Altitude level: 3000m

Lanzhou-Zhangye high-speed railway project

Customer: TBEA Xinjiang Transformer Co., Ltd
Product: 363kV Condenser Dry-type Transformer Bushing
Operation Date: June 2024



时速: 250km/h

张家口 - 呼和浩特高铁项目

用户名称: 特变电工股份有限公司新疆变压器厂
产品名称: 252kV 干式电容型变压器套管 - 在线监测系统
运行时间: 2016 年 10 月

Speed: 250km/h

Zhangjiakou-Hohhot High-speed Railway

Customer: TBEA Xinjiang Transformer Co., Ltd
Product: 252kV Condenser Dry-type Transformer Bushing with Online monitoring system
Operation Date: October 2016



时速: 200km/h

连云港 - 盐城高铁项目

用户名称: 云南变压器电气股份有限公司
产品名称: 252kV 干式电容型变压器套管 - 在线监测系统
运行时间: 2018 年 8 月

Speed: 200km/h

Lianyungang-Yancheng high-speed railway project

Customer: Yunnan Transformer Electric Co., Ltd
Product: 252kV Condenser Dry-type Transformer Bushing with Online Monitoring System
Operation Date: August 2018

恶劣环境 SEVERE ENVIRONMENT



海拔高度: 4500m

金川嘎斯都光伏一期 200MW 光伏项目

用户名称: 常州西电变压器有限责任公司
产品名称: 252kV 干式电容型变压器套管
运行时间: 2023 年 8 月

Altitude level: 4500m

Jinchuan Gasidu 200MW PV project

Customer: Changzhou XD Transformer Co., Ltd
Product: 252kV Condenser Dry-type Transformer Bushing
Operation Date: August 2023



耐低温: -45°C

大唐绥化 2×350MW 机组

用户名称: 新东北电气集团高压开关设备有限公司
产品名称: 252kV 干式电容型 GIS 套管
运行时间: 2017 年 12 月

Low temperature: -45°C

Datang Suihua 2×350MW power plant

Customer: New Northeast Electric Group High voltage switchgear Co., Ltd
Product: 252kV Condenser Dry-type GIS Bushing
Operation Date: December 2017



抗震等级: 9 级

印尼摩罗哇丽拉波项目

用户名称: 常州西电变压器有限责任公司
产品名称: 252kV 干式电容型变压器套管
运行时间: 2023 年 3 月

Seismic grade: Grade 9

Morovirbo Project, Indonesia

Customer: Changzhou XD Transformer Co., Ltd
Product: 252kV Condenser Dry-type Transformer Bushing
Operation Date: March 2023



重盐雾: C5

龙源盐城大丰海上风电

用户名称: 特变电工衡阳变压器有限公司
产品名称: 252kV 干式电容型变压器套管
运行时间: 2017 年 2 月

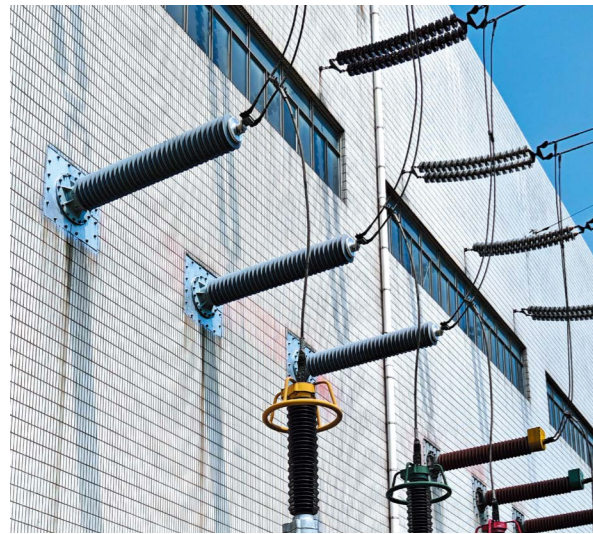
Salt fog conditions: C5

Longyuan Yancheng Dafeng offshore wind power generation

Customer: TBEA Hengyang Transformer Co., Ltd
Product: 252kV Condenser Dry-type Transformer Bushing
Operation Date: February 2017

改造 RENOVATION

原抚顺雷诺尔油式穿墙套管更换为我公司胶浸纤维干式穿墙套管



华能太仓电厂 220kV 穿墙套管改造项目

用户名称: 华能(苏州工业园区)发电有限责任公司
产品名称: 252kV 干式电容型穿墙套管
运行时间: 2024 年 1 月

Replace the original oil bushing with our RIF/RIS dry-type bushing

Huaneng Taicang power Plant 220kv wall bushing renovation project

Customer: Huaneng (Suzhou Industrial Park) Power Generation Co., Ltd

Product: 252kV Condenser Dry-type Wall Bushing

Operation Date: January 2024

原南京电磁、沈阳变压器厂一分厂油式套管更换为我公司胶浸纤维干式变压器套管



湖北华电襄阳低氮燃烧器改造项目

用户名称: 湖北华电襄阳发电有限公司
产品名称: 252kV 干式电容型变压器套管
运行时间: 2017 年 12 月

Replace the original oil bushing with our RIF/RIS dry-type bushing

Hubei Huadian Xiangyang low-nitrogen burner renovation project

customer: Hubei Huadian Xiangyang Power Generation Co., Ltd

Product: 252kV Condenser Dry-type Transformer Bushing

Operation Date: December 2017

原上海 MWB 的 COT 套管更换为我公司胶浸纤维干式变压器套管



龙源内蒙古风力发电有限公司巴音风电场

用户名称: 内蒙古宏瑞电力检修有限责任公司
产品名称: 252kV 干式电容型变压器套管
运行时间: 2018 年 10 月

Replace the original COT bushing with our RIF/RIS dry-type bushing

Longyuan Inner Mongolia Wind Power Generation Project

Customer: Inner Mongolia Hongrui Electric Power Maintenance Co., Ltd

Product: 252kV Condenser Dry-type Transformer Bushing

Operation Date: October 2018

原上海 MWB 的 COT 套管更换为我公司胶浸纸干式变压器套管



国网驻马店局漫里河 110kV 变电站改造

用户名称: 保定变压器有限公司
产品名称: 126kV 干式电容型变压器套管
运行时间: 2022 年 12 月

Replace the original COT bushing with our RIP dry-type bushing

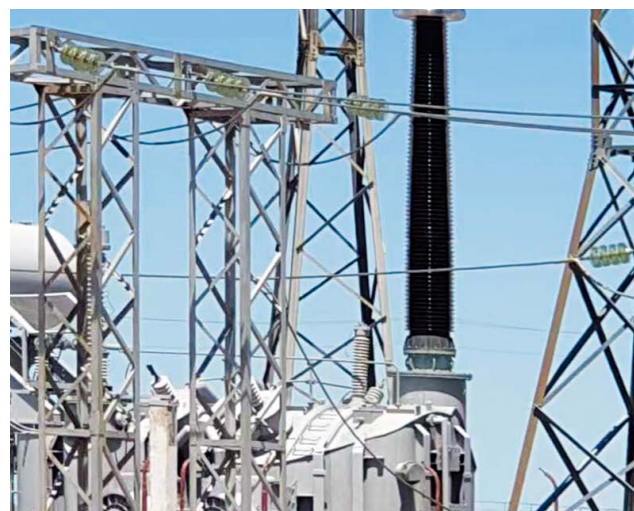
State Grid Zhumadian Bureau Manhe 110kv substation renovation

Customer: Baoding Transformer Co., Ltd

Product: 126kV Condenser Dry-type Transformer Bushing

Operation Date: December 2022

出口项目 EXPORT



耐低温: -60°C

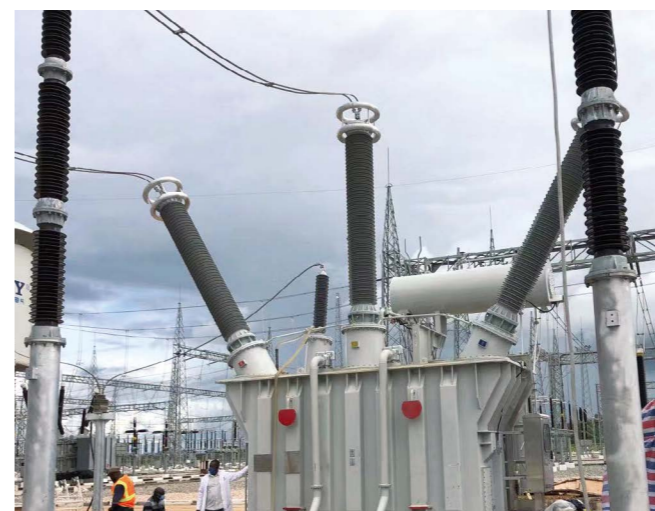
俄罗斯伊尔库茨克电网项目

用户名称: 欧西能源贸易有限公司
产品名称: 550kV 干式电容型变压器套管
运行时间: 2017年5月

Low temperature: -60°C

The Irkutsk power grid project in Russia

Customer: Oasis Energy Trading Co. Ltd
Product: 550kV Condenser Dry-type Transformer Bushing
Operation Date: May 2017



赞比亚下凯富峡 5×150MW 水电站项目

用户名称: 特变电工衡阳变压器有限公司
产品名称: 363kV 干式电容型变压器套管
运行时间: 2023年3月

Construction Project of 5 × 150MW Hydropower Station in Kafue Gorge Lower, Zambia

Customer: TBEA Hengyang Transformer Co., Ltd
Product: 363kV Condenser Dry-type Transformer Bushing
Operation Date: March 2023



哈萨克斯坦电网项目

用户名称: ABMKAZ 有限责任公司
产品名称: 550kV 干式电容型变压器套管
运行时间: 2019年9月

The Kazakhstan power grid project

Customer: ABMKAZ
Product: 550kV Condenser Dry-type Transformer Bushing
Operation Date: September 2019



埃及国家电网公司斋月十日项目

用户名称: 西安西电开关电气有限公司
产品名称: 252kV 干式电容型 GIS 出线套管
运行时间: 2020年10月

Egypt State Grid Corporation Ramadan 10th Project

Customer: Xi'an XD Switchgear Electric Co., Ltd.
Product: 252kV Condenser GIS Bushing
Operation Date: October 2020

产品应用 PRODUCT APPLICATION



油/SF₆ 套管

湖北应城 300MW 级压缩空气储能电站

用户名称: 常州西电变压器有限责任公司
产品名称: 252kV 干式电容型油/SF₆ 套管
运行时间: 2024 年 4 月

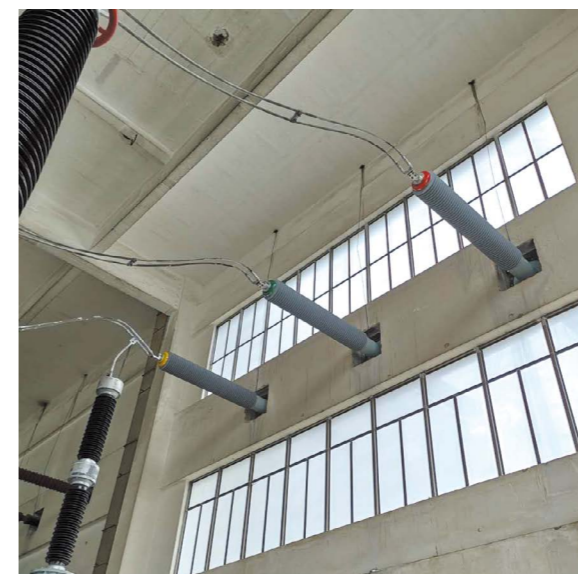
此项目为**世界首台**投入商业运行的 300 兆瓦级非补燃压缩空气储能电站并将在非补燃压缩空气储能领域实现单机功率、储能规模、转换效率三项世界领先

Oil / SF₆ Bushing

Hubei Yingcheng 300MW compressed air energy storage power station

Customer: Changzhou XD Transformer Co., Ltd
Product: 252kV Condenser Dry-type Oil/SF₆ Bushing
Operation Date: April 2024

The project is the world's first 300 MW class non-replenishment compressed air energy storage power station in commercial operation. And will achieve the world leading in the field of single power, energy storage scale, and conversion efficiency.



穿墙套管

云南天安化工项目

用户名称: 云南多德科技有限公司
产品名称: 252kV 干式电容型穿墙套管
运行时间: 2019 年 3 月

Wall Bushing

Yunnan Tianan Chemical Plant Project

Customer: Yunnan Duode Technology Co., Ltd
Product: 252kV Condenser Dry-type Wall Bushing
Operation Date: March 2019



高强度箱变专用套管

承德丰宁风光氢储 1000MW 风电项目

用户名称: 青岛特锐德高压设备有限公司
产品名称: 40.5kV 高强度复合电容型箱变专用套管
运行时间: 2023 年 12 月

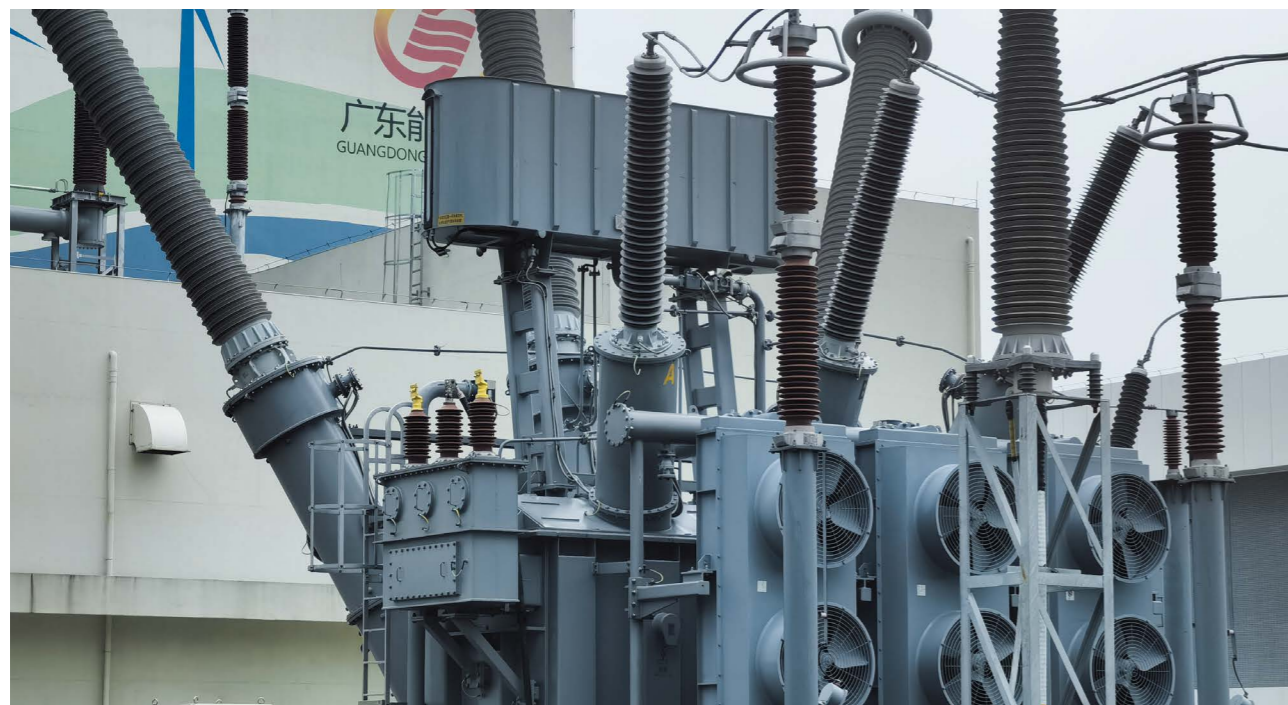
Prefabricated Substation Bushing

Chengde 1000MW wind-hydrogen storage project

Customer: Qingdao TGOOD Electric Co., Ltd.
Product: 40.5kV Prefabricated Substation Transformer Bushing
Operation Date: December 2023



产品应用 PRODUCT APPLICATION



重盐雾: C5

粤电青州一二海上风电项目 2×600MW 机组

用户名称: 西安西电变压器有限责任公司
产品名称: 550kV 干式电容型变压器套管
运行时间: 2024 年 2 月

Salt fog conditions: C5

Yuedian Qingzhou Offshore wind power project 2 × 600MW

Customer: Xi'an XD Transformer Co., Ltd
Product: 550kV Condenser Dry-type Transformer Bushing
Operation Date: February 2024



贵州华电镇宁坝草 200MW 农业光伏项目

用户名称: 西安西电变压器有限责任公司
产品名称: 550kV 干式电容型变压器套管
运行时间: 2024 年 4 月

Guizhou Huadian 200MW agricultural PV project

Customer: Xi'an XD Transformer Co. Ltd
Product: 550kV Condenser Dry-type Transformer Bushing
Operation Date: April 2024



国网浙江台州 220kV 桔乡变

用户名称: 特变电工衡阳变压器有限公司
产品名称: 252kV 干式电容型变压器套管
运行时间: 2018 年 12 月

State Grid Zhejiang Taizhou 220kV Juxiang substation

Customer: TBEA Hengyang Transformer Co., Ltd
Product: 252kV Condenser Dry-type Transformer Bushing
Operation Date: December 2018

产品应用 PRODUCT APPLICATION



甘肃华电环县毛井二期 200MW 风电项目

用户名称: 特变电工股份有限公司新疆变压器厂
西安西电开关电气有限公司 (GIS)
产品名称: 363kV 干式电容型变压器套管、GIS 套管
运行时间: 2021 年 10 月

Gansu Huadian Huanxian 200MW wind power generation
Customer: TBEA Xinjiang Transformer Co., Ltd (Transformer)
Xi'an XD Switch Electric Co., Ltd (GIS)
Product: 363kV Condenser Dry-type Transformer Bushing
363kV Condenser Dry-type GIS Bushing
Operation Date: October 2021



油 / 油套管

山西合成生物产业生态园 220kV 变电站

用户名称: 西安西电变压器有限责任公司
产品名称: 252kV 干式电容型油 / 油套管
运行时间: 2021 年 12 月

Oil / Oil Bushing

220kV Substation in Shanxi Synthetic Biology Industry Park

Customer: Xi'an XD Transformer Co., Ltd
Product: 252kV Condenser Dry-type Oil/Oil Bushing
Operation Date: December 2021



三峡集团会泽火红马路 150MW 光伏

用户名称: 云南变压器电气股份有限公司
产品名称: 252kV 干式电容型变压器套管
运行时间: 2021 年 11 月

Three Gorges new energy Huize Huohong Malu photovoltaic main transformer
Customer: Yunnan Transformer Electric Co., Ltd
Product: 252kV Condenser Dry-type Transformer Bushing
Operation Date: November 2021



蒙能东苏旗巴彦杭盖 300MW 风电项目

用户名称: 特变电工股份有限公司新疆变压器厂
产品名称: 252kV 干式电容型变压器套管 - 在线监测系统
运行时间: 2020 年 7 月

Bayan Hanggai 300MW wind power project of Mengneng

Customer: TBEA Xinjiang Transformer Co., Ltd
Product: 252kV Condenser Dry-type Transformer Bushing with Online Monitoring System
Operation Date: July 2020

产品应用 PRODUCT APPLICATION



油 / SF₆ 套管

新疆阜康抽水蓄能水电站

用户名称: 山东输变电设备有限公司
产品名称: 252kV 干式电容型油 / SF₆ 套管
运行时间: 2023 年 10 月

Oil / SF₆ Bushing

Xinjiang Fukang Pumped storage hydropower station

Customer: Shandong Power Transmission and Transformation Equipment Co., Ltd
Product: 252kV Condenser Dry-type Oil/SF₆ Bushing
Operation Date: October 2023



国家电投 - 内蒙古白音华整流变

用户名称: 江西变压器科技股份有限公司
产品名称: 252kV 干式电容型变压器套管
运行时间: 2019 年 6 月

SPIC Inner Mongolia Baiyinhu rectification transformer

Customer: Jiangxi Transformer Technology Co., Ltd
Product: 252kV Condenser Dry-type Transformer Bushing
Operation Date: June 2019



国网天津蓟州蓟县 220kV 变电站扩建项目

用户名称: 济南西门子变压器有限公司
产品名称: 252kV 干式电容型变压器套管
运行时间: 2019 年 2 月

State Grid Tianjin 220 kV substation expansion project

Customer: Jinan Siemens Transformer Co., Ltd
Product: 252kV Condenser Dry-type Transformer Bushing
Operation Date: February 2019



创新集团 - 内蒙古创源整流变

用户名称: 江西变压器科技股份有限公司
产品名称: 252kV 干式电容型变压器套管
运行时间: 2016 年 9 月

Inner Mongolia Chuangyuan rectification transformer

Customer: Jiangxi Transformer Technology Co., Ltd
Product: 252kV Condenser Dry-type Transformer Bushing
Operation Date: September 2016

