创造绿色智能地下输电系统

Creat green smart underground transmission system

ANKURA

江苏安靠智能输电工程科技股份有限公司

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安靠简介
About Ankura

随着中国经济的快速发展，对电力高效输送服务和现代化智能电网提出了新的挑战。未来，环保安全的地下输电将成为城市电网和电源端输出的主要方式，超高压电缆线路和新型气体管道母线（GIL）将相互弥补来完成这一重要任务。

江苏安靠智能输电工程科技股份有限公司创建于2006 年，公司前期主要致力于超高压电缆输电线路关键技术装备——超高压电缆连接件的国产化研发和制造。为适应智能电网对地下输电提出新的技术需求，公司逐步由关键技术解决向整体系统方案提供发展。时至今日，安靠已成为国内唯一专业的超高压电缆系统解决方案整体供应商：不但为客户提供连接件、敷设用材、监测、控制智能设备；更为客户提供包括：设计、施工、设备成套、试验、运行维护在内的全面专业服务。目前，在电力系统中运行的所有国产化330kV,500kV 电缆线路，均由安靠提供上述服务。这些线路在国家电网、三峡集团、大唐集团等重大工程项目中正为社会经济发展输送着源源不断的绿色能源。

作为国家级高新技术企业，安靠聚焦全球新能源与智能电网建设的发展机遇，不断创新，成功研发了适应大容量地下输电 330kV-1000kV 气体管道母线（GIL），填补国内和国际空白，为实现绿色、智能、安全、可靠的国产化输电系统提供更多选择，安靠助力中国电网健康发展！

How to transmit electricity effectively and construct modern smart grid,is a new challenge for Chinese economy development. In future, green and secure underground transmission will be first choice for urban power grid. EHV cable route and GIL will be complementary to fulfill the significant task.

Jiangsu Ankura Smart Transmission Engineering Technology Co., Ltd was established in 2006. In the early stage Ankura was focused on key technology equipment of EHV cable transmission route: research and manufacture EHV cable accessories. To meet the new technical requirements of Smart Grid underground transmission system, Ankura gradually transforms itself from key technology provider to whole solution provider. Until now Ankura has been the exclusive professional supplier for whole solution of EHV cable system. Ankura not only provides cable accessories, installation material, detection and controlling equipments, but also carries out design, construction, complete equipments, test, maintenance, etc. At present, all domestic 330kV and 500kV cable routes which have been operated in China were provided by Ankura,serving State Grid, Three Gorges, Da Tang, etc.These cable routes have transmitted green energy continually.

As state high and new technology corporation, Ankura grips opportunity derived from global new energy and Smart Grid construction. With continue innovation, Ankura has developed 330kV-1000kV GIL system which is suitable for huge capacity underground transmission, filling the blank in China and worldwide. To realize green, intelligent, secure and reliable domestic transmission system, Ankura devotes itself to healthy development of China power grid!

2006

- 新厂区落成，开始启动超高压电缆系统关键部件，超高压电缆连接件国产化研发。
- 110kV、220kV 电缆连接件通过型式试验。
- The new factory was founded for the research and development of EHV cable accessories.
- 110kV、220kV cable accessories passed type test.

2007

- 披星戴月，夜以继日，500kV 电缆连接件通过型式试验，打破国外垄断。
- 500kV cable accessories passed type test，with intellectual property rights.

2008

- 行业内唯一受邀企业，参与制定行业最高电压 500kV 电缆连接件的国家标准。
- 500kV 电缆连接件通过国家鉴定。
- As the cable accessories enterprise, only Ankura took part in formulating state standards of 500kV cable accessories.
- 500kV cable accessories passed state test.

2009

- 安靠提供电缆连接件并总承包的国产第一条 500kV 电缆线路投入运行，推动中国的超高压电缆发展。
- 成为国家电网、南方电网公司主要电缆连接件供应商。
- Providing whole solution for China first 500kV cable route，which has been operated since 2009, promoting EHV cable transmission in China.
- Being the main cable accessories supplier of State Grid and Southern Power Grid.

2010

- 评为国家电网公司第一家 500kV 电缆连接件合格供应商。
- 包揽国内所有 500kV 电缆输电项目。
- 配套三峡公司的世界首台 800MW 水电项目，为整个线路提供交钥匙服务。
- 国产超高压电缆连接件第一次参加国际重大赛事主场馆建设和广州亚运会保电。
- First qualified supplier of 500kV cable accessories for State Grid.
- Win all 500kV cable transmission bids in this year.
- Ankura served Three Gorges Corporation's world first 800MW hydropower project.
- Domestic EHV cable accessories serve the Asian Olympic Games power transmission,for the first time.

2011

- 包揽该年国内所有水电 500kV 电缆项目。
- 为国家电网，中国国电，中国华电，中国大唐的 500kV 电缆系统提供设计，施工，试验在内的整体服务。
- Ankura won all the bids of China 500kV hydropower projects in this year.
- Providing whole solution of 500kV cable accessories for State Grid,China Guodian,CHD and DTP.

2012

- 福建仙游、向家坝 500kV 电缆线路投入运行。
- Fujian Xian You pumped storage plant and Xiang Jia Ba hydropower plant 500kV cable routes were operated successfully.

2013

- 鲁地拉，岩滩等 5 个 500kV 电缆工程安全运行中。
- 安靠总包国产第一条 330kV 电缆系统在甘肃投运。
- 北京海淀变–国家电网第一条国产 500kV 电缆城市电网项目。
- 具备电力设计勘察总包资质，开启 EPC 总包服务模式。
- Five 500kV cable Transmission systems operated securely.
- The first domestic 330kV cable route was operated in Gansu province.
- Win the bid of Beijing Haidian substation project–first domestic 500kV cable project of State Grid in urban power grid.
- With power design and project qualification survey , start EPC service mode.

2014

- 集合电网，发电，大学，科研院所，社会资源，综合研发的国内第一条 500kV 超高压电缆研发线路正式运行。
- Integrating grid, power generation, universities, research institutes, community resource,the firstdomestic 500kV EHV R&D cable route start to operate.

我们的研发
Research & Development

工欲善其事，必先利其器，自 2006 年公司创立至今我们已累计投入近 3 亿元从事产品的创新及可靠性研究。

公司目前已建成国内最具规模的国家战略新兴产业重点研发平台——超、特高压地下输电研发中心（包括超高压试验大厅，特高压试验大厅，户外试验场，电气试验室，材料试验室，工程试验室）和城市输电科学研究院。

中心内有一回运行的 500kV 电缆线路，运行环境分布在隧道，沟道，桥梁及水下，开展部件的运行可靠性研究，线路及运行环境监测控制，动态增容，线路防火方案，环境运行影响及敷设固定方案的各种研究，为电缆输电系统系列产品长期可靠运行提供保障；为超、特高压输电系统的智能监测控制及动态增容，提供良好的研发条件；同时为 330kV 至 500kV，1000kV 气体绝缘管道母线输电系统（GIL）的可靠性研究创造良好的平台。

超、特高压地下输电研发中心是

- 国家战略新兴产业重点研发平台
- 江苏省认定企业技术中心
- 江苏省智能地下输电工程中心
- 江苏省电缆附件工程技术研究中心
- 城市输电科学研究院

■ 500 kV 电缆连接件，行业唯一

■ 国内唯一提供 330 kV, 500 kV 系统解决方案整体供应商

■ 国内唯一提供专业地下输电方案供应商

To make a perfect work, tools must be advanced.Ankura has invested RMB 300 millions into product innovation and reliability since 2006.

Ankura has established a national R&D platform for strategic emerging industries –UHV，EHV underground transmission R&D center, which is the largest in China. The R&D center includes EHV testing hall, UHV testing hall, outdoor testing field, electric testing room, material testing room, engineering testing room and city transmission institute.

There is a circuit of 500kV cable route in R&D center, providing fundamental research for long term reliability of cable system, intelligent detection and dynamic rating of cable system. The center is also a good platform for the research and development of 330kV to 500kV and 1000kV GIL transmission system.

The EHV、UHV underground transmission R&D center is also :

• The national R&D platform for strategic emerging industries ;

• The Jiangsu authorized enterprise technical center ;

• The Jiangsu authorized smart underground transmission research center.

• The Jiangsu cable accessories engineering technology research center.

• Urban power transmission technology research institute.

■ The exclusive 500kV cable accessories in the industry

■ The only enterprise provides whole solution for 330kV and 500kV cable system in China

■ The only enterprise provides professional whole solution for underground transmission system

500kV 超高压试验大厅 EHV testing hall

大厅尺寸：42 × 33 × 28 m
试验电压 800 kV 系统局部放电 ≤1.5pC
冲击电压最高 3000kV, 额定容量 300kJ
Size: 42 X 33 X 28m
Partial discharge at testing voltage 800kV : ≤1.5pC
The maximum impulse voltage is 3000kV
The rated capacity is 300kJ

1400kV 特高压试验场 UHV testing field

用于 500-1100kV 地下输电系统的研究试验
户外试验场：60 X 40 m
电抗器 1400kV/30A
Research test for 500-1400kV underground transmission system
Size of outdoor testing field: 60 X 40 m
Reactor 1400kV/30A

我们的突破
Key Projects

1 国家电网第一条国产 220kV 电缆试验项目在天津滨海投入运行。
The first domestic 220kV cable project of State Grid has been operated in Tianjin.--

2 酒泉钢铁（集团）有限责任公司嘉北循环经济产业园区，国产第一条 330kV 电缆系统，2013 年 4 月投运。
The first domestic 330kV cable project has been operated since April 2013 in Jiu Quan Steel Co., Ltd.

3 山西同华电力有限公司轩岗电厂 2×660MW 机组工程，国产第一条 500kV 电缆系统 安全运行超过 4 年。
The first domestic 500kV cable project has been operated since 2009 in Shan Xi Xuan Gang power plant.

4 中国长江三峡集团公司金沙江向家坝水电站 500kV 项目，配套世界首台最大 800MW 水电机组，2012 年 10 月投运。
500kV cable project of China Three Gorges Corporation has been operated since October 2012 in Xiang Jia Ba hydropower plant.

5 北京海淀变–国家电网第一条国产 500kV 电缆城市电网项目。
The first domestic 500kV cable urban project of State Grid Corporation in Beijing Haidian.

6 国家电网公司仙游抽水蓄能电站 500kV 工程，世界单根最长 500kV 电缆，2012 年投运。
Xianyou pumped storage plant 500kV cable project of State Grid Corporation has been operated in 2012.

7 中国华电集团金沙江鲁地拉水电站 500kV 项目，2013 年投运。
Lu Di La hydropower plant 500kV project of Huadian corporation has been operated in 2013.

8 中国大唐集团岩滩水电站扩建工程 500kV 项目，2013 年投运。
Yan Tang hydropower plant 500kV cable project of Da Tang Corporation has been operated in 2013.

9 珠海横琴新区–国内 220kV 最长电缆隧道工程，安靠提供电缆敷设系统及敷设安装的全面服务。
The cable laying system of the longest 220kV tunnel has been supplied by Ankura, in Zhuhai Hengqin new District.

10 浙江仙居国内单台机组容量最大抽水蓄能 375MW 项目。
Zhejiang Xianju pumped storage plant cable project

11 江西洪屏世界规划装机最大 2400 MW 抽水蓄能项目。
Jiangxi Hongping pumped storage plant cable project.

12 广州科翔路工程，南方电网目前最大截面最长距离 220kV 电缆工程。
The longest distance and largest section cable transmission project of Southern Grid,Guangzhou xiangke road project.

以电缆连接件为核心，安靠提供技术和服务，配套建设的重要工程有：

Ankura has provided technology and service for the following key projects.

“西电东送”

——中国调整能源结构，促进东西部协调发展的标志性战略工程。其中，向家坝－上海 ±800kV 特高压直流输电线路是目前世界上投入运行的电压等级最高，输送容量最大，输电距离最远的高压直流输电工程。安靠为电源送出提供系统设计方案，电缆敷设系统，第一次实现了国家重大工程中完全使用国产 500kV 电缆系统，突破国内高落差竖井电缆的敷设技术。

West-to East Power Transmission Project--for instance,Xiang Jia Ba to Shanghai ± 800kV UHV D.C transmission route. In this project, the output of electric resource of Xiang Jia Ba hydropower plant has been designed by Ankura as the first domestic 500kV cable system applied in state key project.

“南水北调”

——通过跨流域的水资源合理配置，缓解中国北方水资源严重短缺局面的重大战略性工程。在抽调水源过程中，需要安全可靠的电力传输系统保证大量的能源有效的供应。安靠为该工程配套的电力电缆附件，达到世界领先水平，多项技术国内领先，作为国内供应商，不仅技术和产品质量有保证，服务响应时间短，更为工程提供双重保证。

South-to-North water diversion project--The project needs power system to pump water from low location to high location. Ankura has provided reliable EHV cable accessories to serve the project. As the domestic supplier, Ankura not only ensures the technology and products quality, but also provides convenient service.

“高速铁路与城市轨道交通”

——凭借先进的技术和设备，安靠全力支持铁路轨道交通建设的高速发展，先后参与了许多重大项目的建设，包括京沪、武广高速铁路客运专线等。其中，于 2011 年 6 月投入运行，全长 1318 公里的京沪线是世界里程最长的高铁客运专线。安靠还积极参与城市轨道交通建设。迄今为止，安靠智能输电解决方案广泛应用于北京、上海、广州、深圳等各大城市的地铁与城市轻轨项目中，为地铁和轻轨可靠运营提供技术保障。

High-speed railway and urban railway traffic--With advanced technology and equipment, Ankura takes part in many significant traffic projects, among which railway from Beijing to Shanghai is the longest high-speed railway in the world. Also Ankura participates construction of urban track traffic. Until now, Ankura has provided solution of smart transmission for many traffic projects to guarantee reliable power supply.

“新能源的开发和利用”

——安靠是可再生能源发电先行者，拥有完善的太阳能，风能，水能，等可再生能源解决方案，支持中国高效开发利用清洁能源，优化能源结构，成功应对能源挑战。

The Development and Use of New Energy--Ankura is the pioneer of renewable energy power generation, providing complete solution for power generation and transmission of solar energy, wind energy and water power in order to tackle the energy challenge.

“城市现代化建设”

——安靠拥有成熟的地下智能输电技术，相对与传统架空线输电技术更加经济环保，并且增加土地资源的利用率，安靠的系统总包服务，更可提供多种建设运营模式，加速城市现代化建设。目前安靠的产品以配套天津滨海新区，珠海横琴新区等多个城市和新区。

Modern Construction in Cities--Ankura has mature underground smart transmission technology, which is more economical and environmental, and increase operation rate of land resources compared with overhead line. Ankura' s turnkey service provides many operation modes, accelerating urban modern construction. At present Ankura' s products have been operating in Tianjin Bin Hai New Area, Zhu Hai Heng Qin New Area and so on.

“广州亚运会”

——参与广州亚运会的场馆建设，为其提供特殊连接解决方案，确保亚运会期间电力供应安全可靠，荣获由广东电网公司颁发的 “亚运保供电优秀供应商” 奖章。

Guangzhou Asian Games--Ankura has participated in power system construction for Guangzhou Asian Games, delivering customzied solutions,ensuring reliable power supply during the sports meeting. As a result, Ankura has been awarded by Guangdong Power Grid Company as “Excellent Supplier of power guarantee for Asian Games”

我们的成绩
Certifications & Awards

在超高压电缆系统方面：

In terms of EHV cable system, Ankura has following achievements :

产品拥有各种专利 **45** 项，包括发明专利 **6** 项；

45 patents for the products, including 6 innovation patents ;

拥有国家重点新产品 **5** 项；

5 national important new products ;

拥有省级高新技术产品 **27** 项；

27 province high-tech products ;

3 个系列，**7** 个产品填补了国内空白。

3 series, 7 products fill the blank in China .

高新技术企业

国家火炬计划
重点高新技术企业

ISO9001 认证
证书号
USA13Q29633R0M

采用国际标准
产品

ISO14001 认证
证书号
11412E21944R1M

标准化良好行为认证
证书号
GSP(32L)083-2011

3A 信用企业

江苏省名牌产品
证书号
SM1104350

博士后科研工作站

我们的客户
Customers & Partners

能源 Energy

国家电网 | 南方电网 | 中国华能集团 | 中国大唐集团 | 中国国电 | 中国华电集团 | 中电投

神华集团 | 长江三峡 | 中国电建 | 中国能建 | 中广核 | 京能集团 | 同煤集团

石化 Petrochemical

中石油 | 中石化 | 中海油

制造 Manufacturing

空客 | 大众 | 通用 | 一汽 | 二汽 | 北京现代 | 广汽

钢铁 Steel

宝钢 | 武钢 | 马钢 | 沙钢 | 南钢 | 酒钢

通讯 Telecom

中国移动 | 中国联通 | 中国电信 | 三星 | LG

铁路 Railway

武广高铁 | 京沪高铁 | 上海地铁 | 北京地铁 | 天津地铁 | 武汉地铁 | 广州地铁

电气 Electricity

ABB | 西门子 | 阿尔斯通 | 施耐德

电缆输电系统
Cable Transmission System

- 系统设计
- System Design

- 电缆连接系统
- Cable Accessories

- 接地系统
- Earthing System

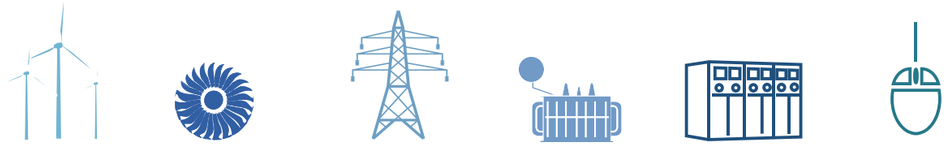
- 智能监测系统
- Intelligent Detection System

- 敷设固定系统
- Laying&Fixing System

系统设计
System Design

安靠长期致力于电能传输系统解决方案的研究制定。并为客户提供交钥匙工程服务，包括从初期的可行性研究到电力系统分析计算再到整个电网接入工程的设计、采购、施工和调试服务。通过高效的管理体系、一流的研发设计团队和优秀的施工队伍，集状态监测、远程控制、预警功能于一体的在线状态监控与分析系统运行管理，帮助客户实现资产投资效益最大化，安全可靠绿色的电力输电系统。

Ankura devotes itself to the research and supply of energy transmission system solution for long term. Ankura provides turnkey project service for customers, including preli minary feasibility study, power system analysis and calculation, design、purchase、construction and testing of power grid access project. Through effective management system、first class R&D team and excellent construction workers, Ankura will be helpful for customers to maximize benefits of assets investment by realizing secure、reliable and green power transmission system.

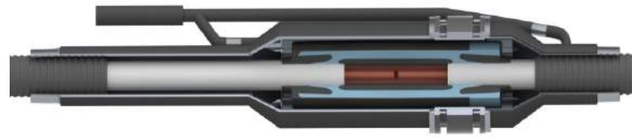


电缆连接系统
Cable Accessories

中间接头
Cable Joint

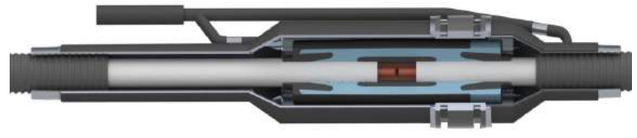
异型接头
Special-shaped Joint

- 整体预制型结构。
- 用于不同截面的电缆对接，产品有长期运行经验。
- Pre-moulded stress relief cone.
- Suitable for different sections,with long time operating experience.



抢修接头
Repair Joint

- 整体预制型结构。
- 根据电缆的长短增加预制件和接管的长度。
- 在电缆长度不够长的情况下可进行接头安装。
- Pre-moulded stress relief cone.
- The length of pre-moulded parts has been increased according to the length of cables.
- The joint can be installed even if the cable is not long enough.



直通接头
Ankura-YJJTI
绝缘接头
Ankura-YJJJI

- 整体预制型结构，产品长期运行可靠。
- 外壳采用绝缘隔磁金属壳保护盒，确保高强度机械保护和绝缘防腐。
- 另备有玻璃钢壳保护盒，可用于隧道直埋及可能浸水的场所。
- Pre-moulded stress relief cone，with long time operating experience.
- The protection casing is made of metal which is anticorrosive and has good mechanical property.
- FRP protection casing is available for joint which is direct buried or immersed in water.

电缆连接系统
Cable Accessories

户外终端
Outdoor Cable Termination

瓷套终端
Ankura-YJZWC4

- 合理的大小伞裙间隔设计、爬距设计，有效提高产品的污闪性能。
- 可靠的密封结构，防止终端在运行过程中渗水、漏油等现象。
- The design of porcelain sheds and creepage distance is reasonable.
- The sealing construction is reliable enough to prevent the water immersion or oil leakage.

复合套终端
Ankura-YJZWCF4

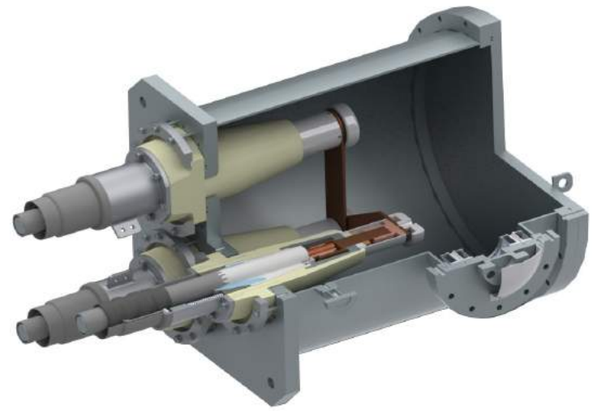
- 环氧套管一次性外覆液体硅胶制成。
- 耐污性，安全防爆性，抗紫外线及良好的抗老化性，适用于户外、沿海及高污秽地区。
- Epoxy bushing is made of liquid silicone rubber.
- The product is pollution resistant and explosion-proof, uvioresistant and anti-ageing, suitable for outdoor, coastal or high pollution area.

全预制干式终端
Ankura-YJZWG4

- 进口液体硅胶一次性注射成型。
- 无油、有机绝缘、防爆、免维护，适用于城市中心人口稠密地区及周边地区。
- 结构简单，安装位置灵活 体积小 重量轻，能够适应各类恶劣气候条件和高污染地区。
- Pre-moulded by liquid silicone rubber.
- The product is oil free and organic insulated, explosion-proof and maintaines-free, suitable for populous area in urban center.
- The construction is simple and small, suitable for harsh weather conditions and high pollution areas.

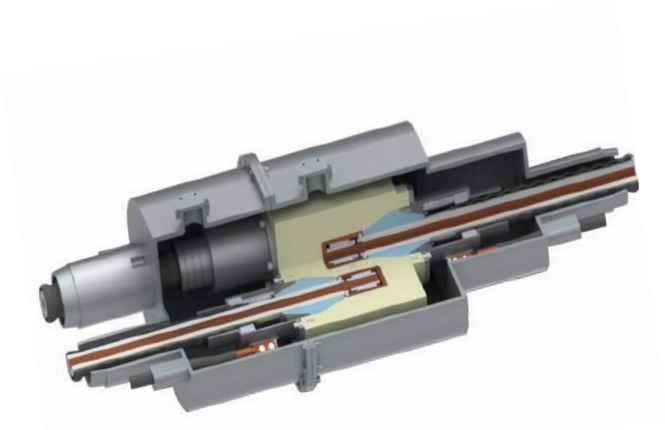
电缆连接系统
Cable Accessories

分支接头
Branch Joint



气体绝缘分支接头
Ankura-FZX

- 产品箱体填充绝缘气体 SF_6。
- 装有防爆膜、压力表、报警器以及充 / 放气阀等装置。
- 可简化供电线路接线方式，节约投资用地。
- The product is filled with insulation gas SF_6.
- Equipped with explosion-proof film, pressure gauge, alarm device and gas valve.
- Simplify wiring power lines, saving investment and space.

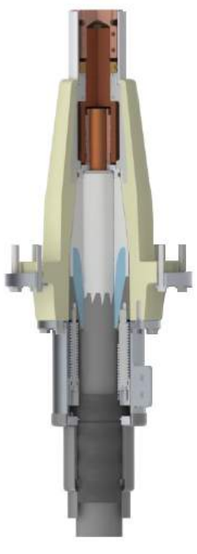


固体绝缘干式分支接头
Ankura-FZX-GT

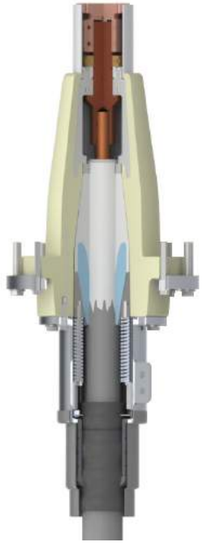
- 环氧树脂真空浇注成型。
- 全绝缘、全干式、占地小、免维护。
- 适用于地面室内，电缆隧道，工井内，能最大限度节约投资和用地。
- 根据工程需要，可预留线路，方便不同电缆截面之间的转换。
- The product is made of epoxy resin.
- The product is dry type, covers small area and maintenance-free.
- Suitable to be installed in cable tunnel and cable well, saving investment and space.
- Providing alternative lines for cables of different sections.

电缆连接系统
Cable Accessories

GIS 终端、变压器终端
Cable terminations for transformers and GIS



插拔式
Plug-in connector



压接式
Compress-in connector

变压器终端
Ankura-YJZGGCB

- 预制应力锥加环氧套管的组合型结构。
- 终端出线杆采用插拔式结构，适用于各种型式变压器。
- 安装简便，接地可靠，免维护。
- Premolded stress cone and epoxy bushing.
- Plug-in connector kit consisting of plug-in connector,suitable as a fixed connection point in a transformer without a cable box or where the box is filled with oil.
- Simple installation,reliable earthing and maintenance-free.

GIS 终端
Ankura-YJZGG

- 预制应力锥加环氧套管的组合型结构。
- 终端出线杆采用压接式或插拔式结构，适用于各种型式 GIS 组合电器。
- 安装简便，接地可靠，免维护。
- Premolded stress cone and epoxy bushing.
- Plug-in connector kit or compressed-in connector kit consisting of intergrated insulator,suitable as a fixed connection point in a gas-insulated switchgear.
- Simple installation,reliable earthing and maintenance-free.

电缆连接系统
Cable Accessories

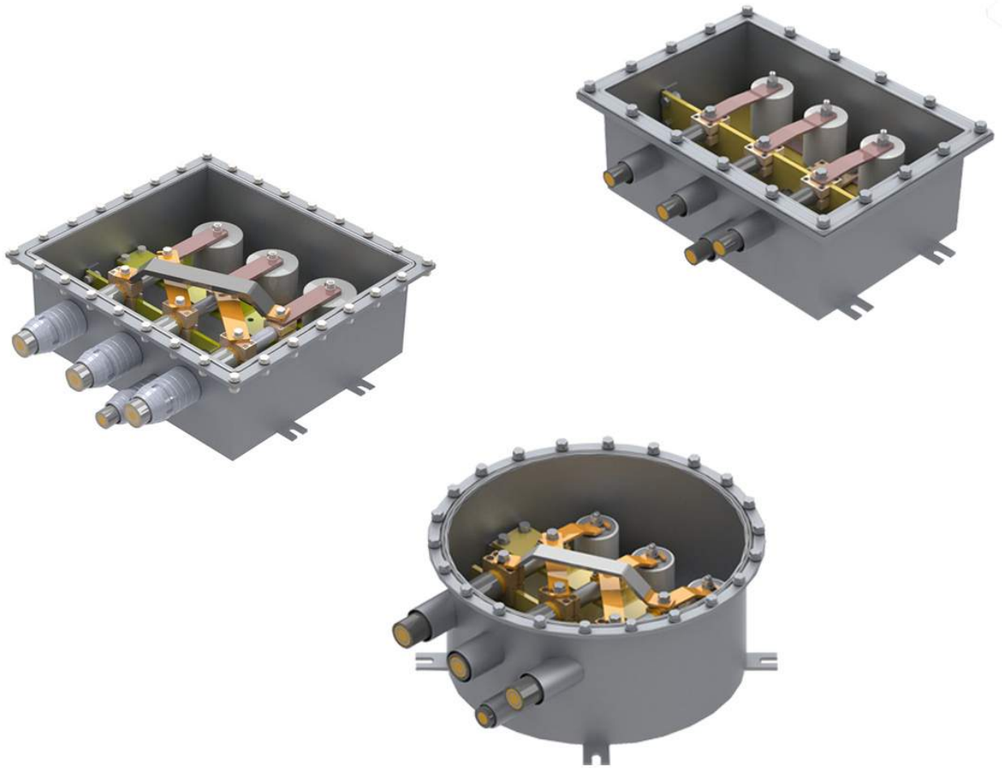
中压产品
Medium-Voltage Cable Accessories

全冷缩户内、户外及中间接头
Premolded cable termination and cable joint, indoors or outdoors

- 全套产品采用最先进的全冷缩技术。
- 采用独有的密封工艺，加上硅橡胶优良的绝缘性、高恢复弹性、密封性及憎水性，能广泛运用于高海拔、盐雾及重污染地区。
- 安装简便，无须特殊培训，有效减少因操作不当造成的质量事故。
- Premolded cold shrink technology for all Medium Voltage products.
- Premolded cable termination made of silicone rubber with integrated field control and top sealing. Applicable for high altitude,salt fog and heavy polluted areas.
- Simple installation,no special training,effectively reducing the quality accidents caused by impoper operation.

电缆分接箱
Cable cabinet

- 用于 10/35kV 电力电缆需要多路分支的场合。
- 全密封、全绝缘、免维护、耐腐蚀、结构紧凑、安全可靠。
- 多种电缆插头可供选择，进出线灵活，实际应用最多有 6~8 分支进线。
- A solution provided for branching in a 10/35kV cable grid with multiple branches.
- Totally sealed,fully insulated,maintenance-free,corrosion-resistant,safe and reliable.
- Severial promolded screened separable cable connectors are provided, flexible into and outlet, up to 6/8 cables can be connected in parallel.



接地系统
Earthing System

接地箱、接地保护箱
Link Boxes for earthing and protective earthing

- 不锈钢板和特种绝缘材料为箱体材料，密封可靠。
- 内部采用铜板连接，可直埋安装，也可挂墙安装。
- 接地保护箱内部配有电缆护层保护器，能有效防止电缆护层过电压。
- Cabinets made by stainless steel and special insulation material,reliablly sealed.
- Cu- internal connections,buried installation or wall mounted.
- SVL inside, effectively prevent over-voltage on cable sheath.

交叉互联箱
Link Boxes for cross-bonding

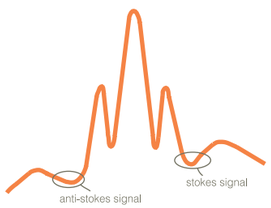
- 金属屏蔽层的交叉互联。
- 提高电缆的输送容量，防止电缆外护层被击穿，确保电缆安全可靠运行。
- 可提供不锈钢、木质、复合玻璃钢等不同的箱体材料。
- Cross-bonding among metal shielding layers.
- Improve cable transmission capacity, prevent outer sheath breakdown, ensure cable reliable operation.
- Different cabinet materials are provided, e.g. stainless steel, wood, composite glass-steel etc.

智能型接地箱
Intelligent Link Boxes for earthing

- 满足智能电网中不同控制和监测需求的接地箱。
- 选配电流表，电流计数器等传感器，监视器。
- The link boxes are designed to meet different control and detection needs of smart grid.
- Optional sensors and monitors, e.g. ammeters, current counters, etc.

智能监测系统
Intelligent Detection System

DTS 光纤测温系统
Distributed Temperature Sensing System



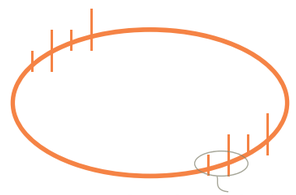
Raman Reflact

- 连续分布式，测量电缆全长范围内的电缆表面或护层温度。
- 十几公里内远程实时监测，大大降低误报和漏报率。
- 寿命长、成本低、系统简单、灵敏度高、精度高，本征防雷，真正实现电力电缆系统的智能化监测。
- Distributed continous measurement of cable surface temperature and cable sheath temperature over the entire length.
- Real-time remote monitoring over 10 kilometers, effectively reducing false positives and false negatives.
- Long life-circle,low cost,simple system,high sensitivity,high precision,intrinsic lighting,that makes intelligent detection system possible.

接地电流监测系统
Earthing Current Monitoring System

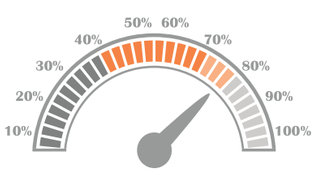
- 金属护套接地线上加装电流互感器。
- 实时监测接地电流的变化，避免因接地漏电流过大造成的影响。
- 实时存储、历史数据查询、报警信息打印、护层环流实时曲线分析等功能。
- 产品安全可靠、技术先进、设计经济、界面友好、易于扩展。
- Current transformer is installed on metal sheath earthing cables.
- Real-time detection of groun current changes, to avoid the impact caused by huge earth leakage.
- Real-time storage,historical data quety,alarm information print,real-time sheath circulation curve analysis.

局部放电监测系统
Partial Discharge Detection System


Partical Discharge Signal

- 国际上公认的检测电力电缆系统绝缘水平较有效手段。
- 系统安全可靠，具有良好的信号传递线路性能。
- 安靠内置超高频传感器与脉冲电流传感器相结合的方式，配以后端检测线路与高性能监测主机，对电力电缆系统绝缘薄弱环节进行局放监测，实现准确监测电力电缆系统绝缘状态。
- Interationally recognized method to detect power cable insulation level.
- Safe and reliable system,with good signal trans-performance.
- Ankura built-in UHF sensor and pulse current sensor combination, together with the rear end and high-performance detection host,can do PD detection to the weaknesses of power cable system,achieving accurate detection of insulated states.

动态增容系统
Dynamic Rating System



- 采用动态载流量技术，通过对导线温度以及线路局部外部环境进行在线监测。
- 依据现场所采集的数据，实时计算当前线路的稳态输送容量限额，提高线路输送容量。
- 在线实时监测 调度未来较长时间的载流量并采取增减措施，提高资产的可靠性和利用率。
- Adopt dynamic carrying capacity technologies to measure local cable temperature and the external environment data online.
- Based on data collected on site,real-time calculation limited steady-state cable transmission capacity to improve the capacity.
- Online real-time detection, take measures to improve the reliability and availability of assets.

敷设固定系统
Laying&Fixing System

电缆夹
Cable Clamp

- 适合电缆直径 80-180mm，不同结构型式的电缆夹。
- 结构紧凑合理，安装方便灵活，和电缆接触面积大，抱紧可靠，表面光滑，对电缆无任何损害。
- 适用于全天侯，多环境下的电缆固定。
- Different structural types of cable clamp,suitable for cable diameter from 80 to 180 mm.
- Compact structure, convenient and flexible installation,large cable contact area,reliable fixed, smooth surface, and without any damage on the cable.
- Suitable for all-day, multi-environment cable fixing.

电缆固定支架
Cable Fixing Brackets

- 产品采用型钢焊接或冲压一次成型，外表面采用防腐处理。
- 根据设计要求的不同，可用于 1 根、2 根、3 根平行电缆的固定。
- 具有滑动结构的电缆固定支架受专利保护，用于电缆的滑动伸缩，减少电缆敷设固定的工作量。
- Section welding or stamping to the model shape, outer surface anticorrosive treatment.
- Depending on the design requirements, applicable for 1, 2, 3 parallel cables fixed.
- Cable fixing bracket with sliding structures are Protecting Innovations,used for cable sliding,to reduce workload for cable fixing.

电气性能
Electric Performance

瓷套式、复合套式户外终端 / 中间接头 / GIS 或变压器终端
outdoor cable termination of porcelain or composite insulator/cable joint/cable termination for GIS or transformer

电压等级 voltage level	额定电压 rated voltage	最高运行电压 maximum operating voltage	工频耐压 30 分钟 30min A.C withstand voltage	雷电冲击耐压 impulse voltage
kV	U_0 / kV	U_m / kV	kV	kV peak
52 / 66	52	72.5	130	325
64 / 110	64	126	160	550
76 / 132	76	145	190	650
87 / 150	87	170	218	750
127 / 220	127	252	318	1050
160 / 275	160	300	400	1050
190 / 330	190	362	420 *	1175
220 / 400	220	420	440 *	1425
290 / 500	290	550	580 *	1550

* 工频耐压时间 60 分钟 . * A.C withstand time up to 60 min.

全预制干式终端 / 分支接头
premoled cable termination / branch joint

电压等级 voltage level	额定电压 rated voltage	最高运行电压 maximum operating voltage	工频耐压 30 分钟 30min A.C withstand voltage	雷电冲击耐压 impulse voltage
kV	U_0 / kV	U_m / kV	kV	kV peak
52 / 66	52	72.5	130	325
64 / 110	64	126	160	550
76 / 132	76	145	190	650

中压产品
medium-voltage cable accessories

电压等级 voltage level	工频耐压试验 A.C withstand voltage	工频耐压试验 A.C withstand voltage	冲击电压试验 impulse voltage	局部放电试验 partial discharge test
kV	50Hz,5min / kV	50Hz,15min / kV	kV peak	
8.7 / 15	39	23	95	15kV, ≤ 2 pC
18 / 24	81	45	170	31kV, ≤ 2 pC
26 / 35	117	65	200	45kV, ≤ 2 pC

GIL 作为大容量、高电压、长距离地下输电线路，采用金属封闭的刚性结构，具有输电容量大、损耗低、占地少、布置灵活、可靠性高、安全防护性好、免维护、寿命长与环境相互影响小等优点。通过合理规划和设计，不但可以大大降低系统造价，而且也能提高系统的可靠性。作为一种优秀的电力传输设备，具有广阔的市场前景和生命力。

As a compact, reliable method for transmitting large amounts of power over long distances,Gas insulated line is a metal sealled rigid structure,with advantages of large transmission capacity,low loss, flexible layout,high reliability,good security, maintenance-free, long life and little interaction with the environment.The GIL system provides economic advantages for in-stallation, operation, and maintenance.

GIL 最高输电电压可达 1000kV 是目前特高压地下输电线路的唯一解决方案。
The highest transmission voltage of GIL up to 1000kV that makes it the only solution to the current UHV underground transmission lines.

GIL 输电系统
GIL Transmission System

- 气体管道母线
- Gas Insulated Transmission Line

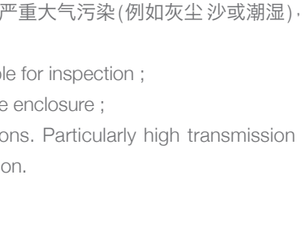
- GIL 套管
- GIL Bushing

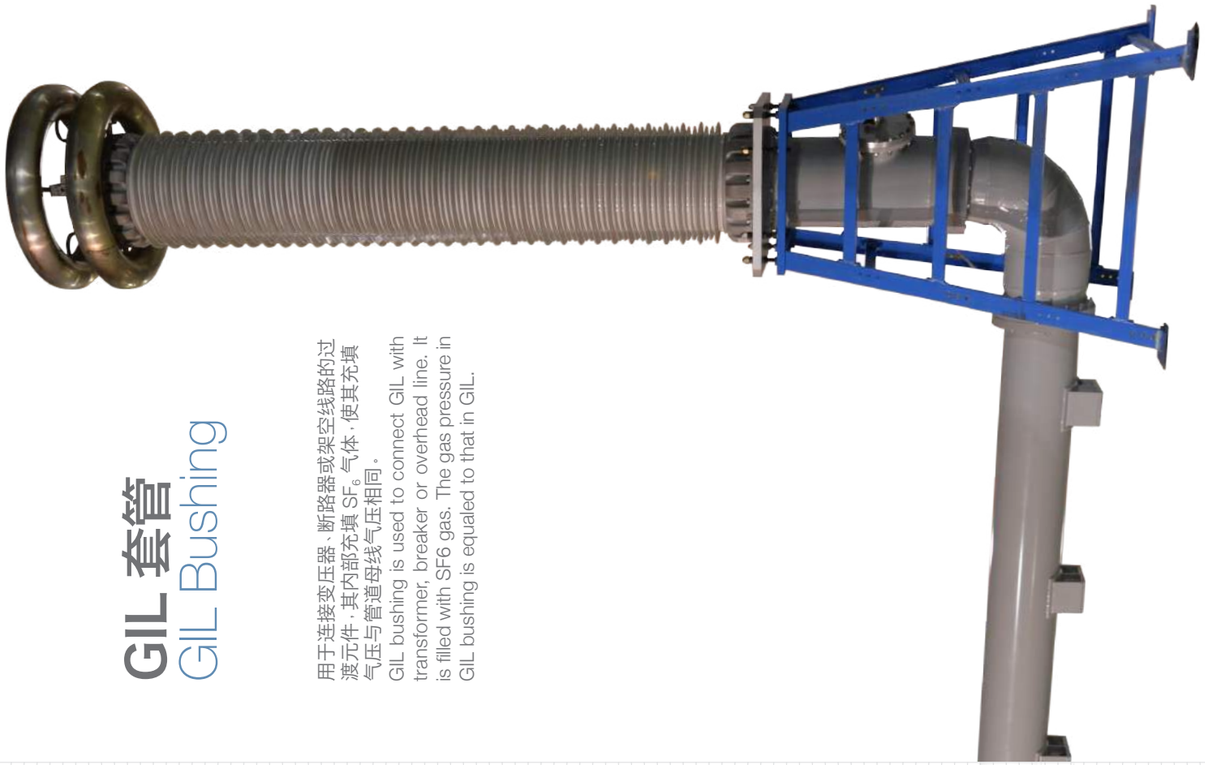
- GIL 监测系统
- GIL Detaction System

气体管道母线
Gas Insulated Transmission Line

管道母线输电回路均由接地合金铝外壳和内置管状合金铝导体组成，通过直管段、弯管段、T 型段和交叉段组件，实现灵活对接，其组件在工厂预制组装，现场安装调试，可节约大量人力时间成本，实现最大效益化。
The basic GIL transmission lines consists of a grounded aluminum alloy tube,which encloses a concentric tubular aluminum alloy conductor.The various components of the GIL assembly including straight sections, elbows, tees, and crosses are factory assembled,saving human resources and maximizing the benefits.

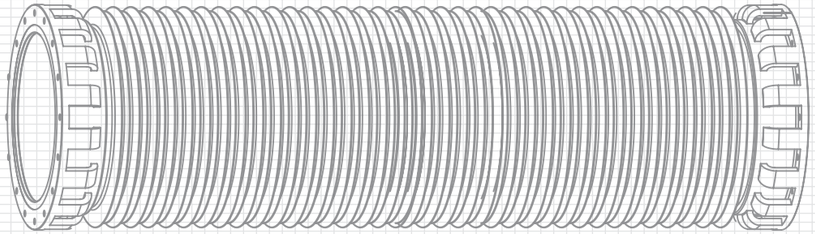
- 由预制结构部件组成的隧道是一种快速、简单的 GIL 系统安装方式，隧道安装。
- GIL 管道外壳本身具备了各种防腐保护，可采用直埋安装；
- GIL不会受到诸如高环境温度 强烈太阳辐射或者严重大气污染(例如灰尘 沙或潮湿)，可采用地面安装；
- GIL systems installed in a tunnel remain accessible for inspection ;
- Lines wrapped with polyethylene to safeguard the enclosure ;
- GILs are largely unaffected by extreme conditions. Particularly high transmission power can be achieved with aboveground installation.

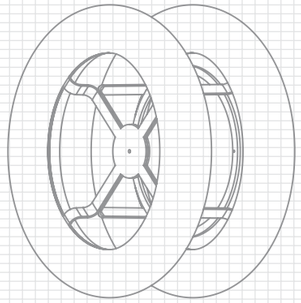


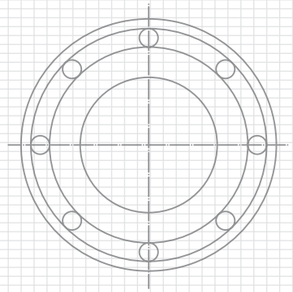


GIL 套管
GIL Bushing

用于连接变压器、断路器或架空线路的过渡元件，其内部充填 SF_6 气体，使其充填气压与管道母线气压相同。
GIL bushing is used to connect GIL with transformer, breaker or overhead line. It is filled with SF6 gas. The gas pressure in GIL bushing is equaled to that in GIL.







GIL 监测系统
GIL Detection System

GIL 设备的监测装置有局部放电监测、内部故障定位在线装置、气体压力监测、温度监测、SF_6 气体泄漏监测、火灾自动报警监测等，这些监测系统可以保证 GIL 设备的可靠运行。
There is comprehensive detection system in GIL to detect partial discharge, gas pressure and leakage, temperature and internal fault location. The monitoring system ensures the reliable operation of GIL.

性能参数
References

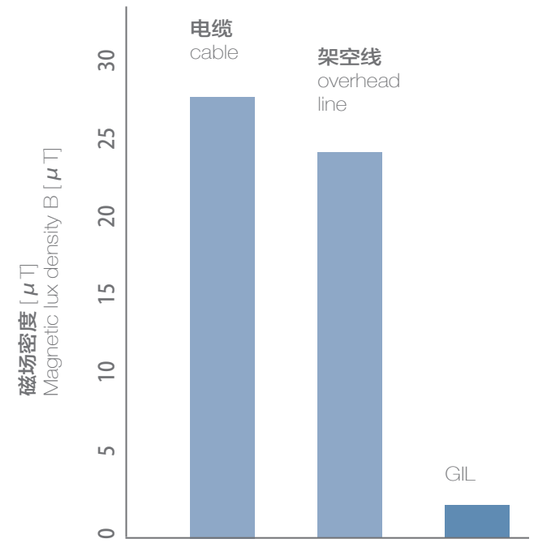
GIL 输电系统
GIL transmission system

额定电压 rated voltage	工频耐压 A.C withstand voltage	雷电冲击耐压 impulse voltage	操作冲击耐压 Switching surge insulation level
kV	1min / kV	kV peak	kV peak
72.5	140	325	/
126	230	550	/
252	460	1050	/
363	520	1175	950
550	710	1550	1175
800	960	2100	1425
1000	1100	2400	1800

GIL 输电优势
GIL transmission advantages

- 传输电压最高可达 1000 kV。
- Max voltage: up to 1000 kV.
- 不配套无功功率补偿的情况下，传输距离最远可达 70 公里。
- Max transmission distance without com- pensation of reactive power: up to 70 km.
- 长期抗老化，且性能保持不变。
- Performance remains constant over time; no aging.
- 安全防火。
- Fireproof.
- 高过载能力。
- High overload capacity.
- 高短路过载能力。
- High short-circuit withstand capacity.
- 最低的电磁场。
- Lowest electromagnetic field.

不同高压输电系统磁场比较
A comparison of the magnetic fields for different high-voltage transmission



服务模式
Service Mode

1. 工程咨询
2. 工程设计
3. 工程施工（安装.敷设）
4. 安装监督
5. 线路试验
6. 项目管理
7. 故障查找
8. 安装工具
9. 员工培训
10. 线路智能升级改造
11. 电缆系统运行维护

1. Project consultation
2. System design
3. Construction (accessories installation, cable laying)
4. Installation and supervision
5. Route Testing
6. Project management
7. Fault localization and cable repair
8. Leasing of installation equipment
9. Professional training
10. Disassembly and recovery of old cables
11. Cable system operation and maintenance

电力系统设计与总包服务
Energy System Design & EPC Service

安靠公司旗下的安靠电力设计有限公司是一家同时具备火电、送电、变电设计乙级资质的民营公司。其经营范围为电力行业的工程勘察、设计、总承包、咨询、监理等；设计资质：电力行业（送电、火电、变电）设计乙级资质；工程勘察专业类（工程测量）乙级资质。

Ankura has a subsidiary company Ankura Power Design Co., Ltd. It has Grade B qualification of designing thermoelectricity, power transmission and transformation. Also it has Grade B qualification of engineering survey. Its business scope is engineering survey, design, turnkey service, counseling and superintendence.

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