国联电缆附件
GUOLIAN CABLE ACCESSORIES



PRODUCT
SELECTION MANUAL
CABLE ACCESSORIES

COMPANY PROFILE

Shenyang Guolian Cable Accessory Manufacture Co., Ltd.

In 2002, a professional technical team led by Tang Baoyu took over the manufacturing technology of high-voltage cable accessories from Shenyang Cable Factory . Guolian has been focusing on and deeply engaged in the field of high-voltage cable accessories.







Thirty years of dedication have made us an invisible champion in the high-voltage field

As a participant in China's independent research and development of 110kV high-voltage cable accessories, Guolian has been deeply engaged in the field of high-voltage cable accessories. In 2010, it won the bid for the first centralized procurement of 110kV cable accessories by the State Power Grid. In 2018, its 220kV cable accessories passed authoritative testing. The independently developed OFFSET expansion compensation device for high-voltage cable bridge laying has broken the foreign technical blockade and explored a leading technical route.

Embrace the energy transformation and create a new future.

Facing the opportunities of the new-era energy revolution, Shenyang Guolian is evolving from a "technology follower" to a "standard setter". We have always firmly believed that in the core fields related to national energy security, the technical sovereignty of national enterprises must be firmly in our own hands. With 30 years of technical accumulation, Guolian is willing to work with industry peers to compose a new chapter in China's high-voltage cable technology!

Building a full-industry-chain technical service system to forge core competitiveness.

Guolian has established a "three-dimensional value model of R&D - intelligent manufacturing - engineering services". Its engineering services team received a letter of commendation from users for the power supply guarantee line of Yabuli Ski Resort during the 2024 Winter Asian Games. The company has obtained more than 200 patents, software copyrights, and technical reports. It is a national high-tech enterprise, a "little giant" enterprise specializing in precision, sophistication, and specialization, as well as a provincial-level enterprise technical center. The technical R&D department has carried out in-depth industry-university-research cooperation with multiple universities and research institutes to jointly explore and expand innovative achievements.





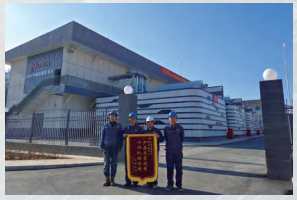


Focus on high-voltage accessories for 30 years feel at ease to choose guolian cable accessories

The commissioning of a number of domestic and foreign projects, such as the 110kV terminal at Yangbajing, Tibet, located at an altitude of 4300 meters, the intelligent monitoring model project of PetroChina Dagang Oilfield, the Zhonglian Green Big Data Project, the 2.2 million tons per year steel project of India Electric Steel Corporation, the 330kV power station and 132kV transmission line in Nigeria, and the Thailand TPIPP 150MW power plant project, has enabled Guolian to win the market with "high-quality products" and "strong services", and to demonstrate the global influence of Made in China through practical actions.







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FOCUS ON HIGH-VOLTAGE ACCESSORIES FOR 30 YEARS
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30

DEVELOPMENT HISTORY

承制造业强大基因 筑辉煌篇章

1937
March 19th Electric wires in Northeast China

1946
April 8th Shenyang Electrical Equipment Factory

1950
January 1950 No.7 Factory of Northeast Electrical Engineering Bureau

1953
August 1953 Renamed as Shenyang Wire Factory

1956
July 1956 Renamed as Shenyang Cable Factory

1983
In the 1980s, the manufacturing technology of cable accessories in China was just emerging. At that time, Shenyang Cable Factory, the largest cable factory in China, introduced the advanced manufacturing technology of 6kV-110kV cross-linked polyethylene cable accessories from KABELDON of Sweden.
Shenyang Cable Factory successfully developed 500kV oil-filled cables, which were put into operation on the power grid.

1984
Shenyang Cable Factory began to produce dry-process cross-linked polyethylene power cables, replacing the previous paper-insulated power cables. These new cables not only have superior electrical and heat-resistant properties, along with advantages such as high operating temperature resistance and large transmission capacity, but also make the laying, installation and maintenance of cables simpler and cleaner. This is a great epoch-making transformation in China's cable industry.

1986
The domestically-made 110kV cable accessories were successfully trial-produced at Shenyang Cable Factory.
Mr. Tang Baoyu joined Shenyang Cable Factory.
The domestically-made 63kV high-voltage cross-linked polyethylene power cable was successfully trial-produced at Shenyang Cable Factory, and by the end of the same year, the cable accessories passed the introduction acceptance check.

1987
The domestically developed 110kV high-voltage cross-linked polyethylene power cable was successfully trial-produced at Shenyang Cable Factory.

1993
In December, the research and development project of 110kV cross-linked polyethylene cables and their accessories by Shenyang Cable Factory won the Second Prize of the Ministry of Machinery Industry of the People's Republic of China.

1994
Mr. Tang Baoyu successively served as the director of the Cross-linking Branch of Shenyang Cable Factory and the general manager of Shenyang Power Cable Co., Ltd. During this period, he led the team to complete the mass production and delivery of 100 kilometers of 110kV cables at Shenyang Cable Factory.

1997
Mr. Tang Baoyu participated in the reception of Qiao Shi, then - Chairman of the Standing Committee of the National People's Congress.

2001
During the restructuring of state-owned enterprises, Mr. Tang Baoyu led the core technical team specializing in cables and cable accessories to establish Shenyang Guolian Cable Accessories Manufacturing Co., Ltd. The company inherited the manufacturing technology of high-voltage cable accessories from Shenyang Cable Factory and has become a leading professional enterprise in China engaged in the design, research and development, and manufacturing of high-voltage cable accessories.

2002
June 5, 2002 Shenyang Guolian Cable Accessories Manufacturing Co., Ltd. was registered and established.
In the same year, the 110kV porcelain-sleeved terminations passed the inspection by the Electric Equipment Quality Inspection Center of the Electric Power Industry (Wuhan High Voltage Research Institute).
In the same year, the 66kV porcelain-sleeved cable terminations were put into operation on the power grid of Fuxin Power Plant.

2005
Obtained ISO 9001 quality management system certification
The main products have passed the inspection by the Electric Equipment Quality Inspection Center of the Electric Power Industry (Wuhan High Voltage Research Institute)

2007
The National Development and Reform Commission issued the "Medium and Long-Term Development Plan for Renewable Energy", marking the entry of China's wind power industry into a golden period. From 2008 to 2012, Guolian continuously provided cable accessory products and installation technical services for wind power projects of China Power Investment Corporation, Datang, Huaneng and other companies. Up to now, these projects have been operating safely for more than 10 years.

2010
Shenyang Guolian won the bid for the first batch of 110kV cable accessory projects in the centralized bidding and procurement of State Grid Corporation of China.
The 110kV outdoor cable terminal products at Yangbajing, Tibet, which is located at an altitude of 4300 meters, successfully passed the acceptance check.

2011
A 500kV high-voltage test hall was built.

2012
Obtained 10 patents

2014
The plant expansion and renovation were completed, with a 100,000-class clean workshop built to achieve environmental upgrading.
The company was rated as a high-tech enterprise.
The Guolian trademark was awarded the title of "Famous Trademark of Shenyang".

2016
Obtained certifications for OHSAS 18001 (now ISO 45001) Occupational Health and Safety Management System and ISO 14001 Environmental Management System
The high-voltage 132kV cable accessory products exported to KEI of India all passed the type tests in India.

2017
Six major products of the company were awarded the title of "Key Industrial Quality Products of Shenyang" by the Shenyang Municipal People's Government.

2018
The 220kV integrated intelligent prefabricated insulation joint with built-in temperature measurement and partial discharge functions has passed the inspection by the National Wire and Cable Quality Supervision and Inspection Center.

2020
During the epidemic, the company carried out emergency repairs against the odds to ensure power supply, and received a "Letter of Commendation" from Xi'an Power Supply Branch.
Mr. Tang Baoyu, the chairman, was awarded the title of "2019 Innovative Entrepreneur of Shenyang".
The company was rated as a "Specialized, Refined, Peculiar and Novel" enterprise in Liaoning Province.
The high-voltage cable bridge laying expansion compensation device OFFSET was successfully put into operation in China Southern Power Grid.

2021
The model project of the intelligent online monitoring system for cables on Jinqi Highway in Tianjin Dagang Oilfield of PetroChina has been delivered.

2022
Was rated as a national-level "Specialized, Refined, Peculiar and Novel" enterprise.

2024
Shipments hit a new high: 110kV exceeded 10,000 sets, and 220kV exceeded 1,000 sets.
Completed the in-plant verification test of 500kV cable accessories.

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01

1-220KV CABLE ACCESSORIES

PART 01

IT IS WIDELY APPLIED IN VARIOUS FIELDS SUCH AS ENERGY AND ELECTRIC POWER, ENSURING THE STABLE OPERATION OF POWER SYSTEMS.

220 kV Outdoor Termination With Composite Insulator



Brief Introduction

Product Model: YJZWFY

Executive Standards:
IEC 62067 GB/Z 18890

Applicable Environment:
Temperature range: -50℃～50℃,
Suitable for both indoor and outdoor installation,
Altitude: less than 4000 meters

Scope of Application:
Installed on iron towers or brackets, and connected to overhead lines, transformers, electrical switches and other equipment.

Scan the code to view detailed parameters

Technical Specification

System rated voltage U0/U	Applicable conductor cross-section	Impulse withstand voltage level (BIL)
127kV/220kV	400-2500mm^2	1050kV

Partial discharge test	Weight
190kV＜5pC	≈370kg



Harbin Bin County Wind Power Project



Sichuan Shanshan 220kV Transmission Line Project



Yanggao 220kV Substation Project



Qinhuai Big Data Center Transmission Project

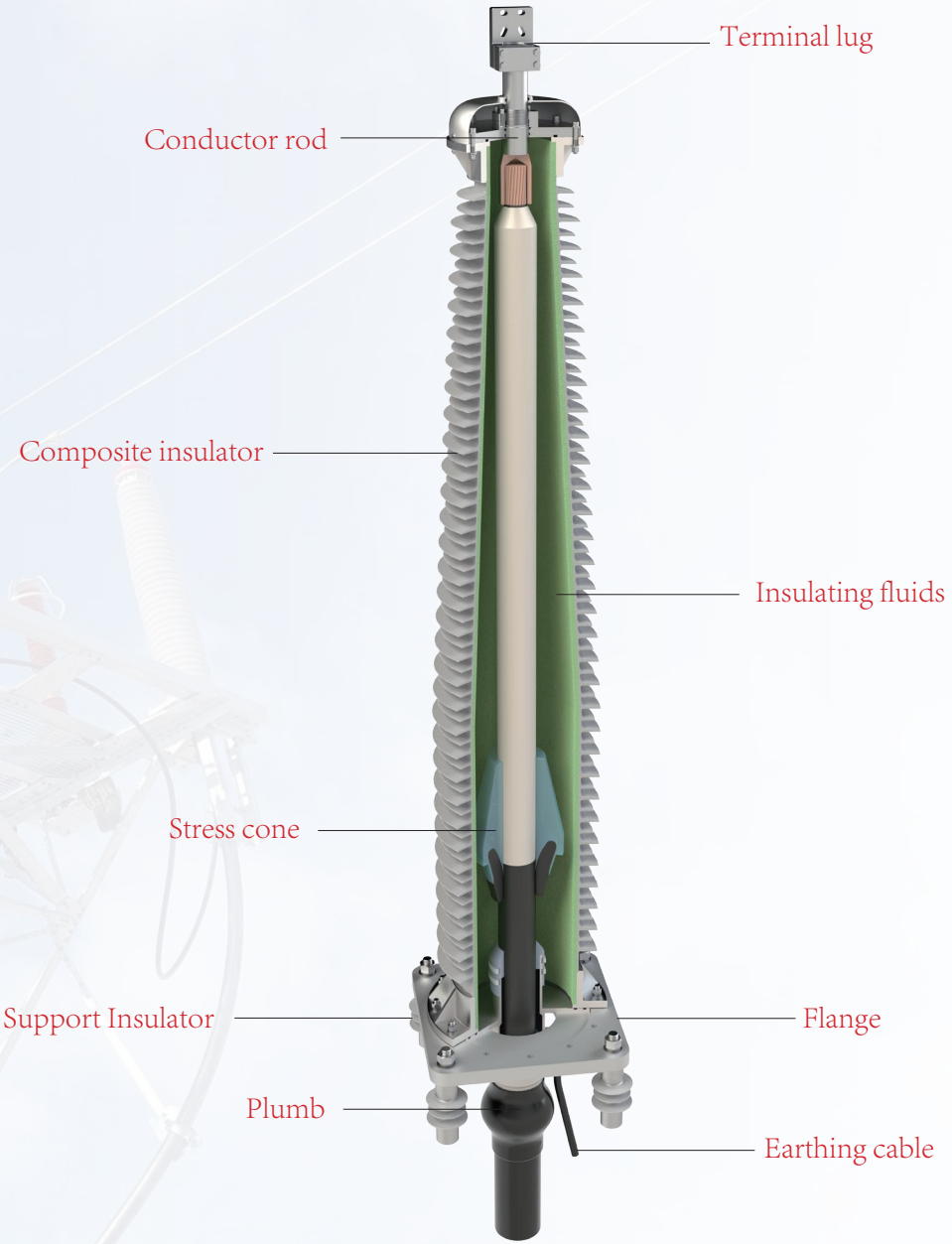
Technical Advantages and Features of the Product

The stress cone is formed by injection molding of high-quality imported liquid silicone rubber and designed with finite element optimization, which solves the problem of electric field optimization of the product to ensure the reliability of the product during long-term operation.

The termination adopts a multi-seal structure and is detachable, which can solve the problems of water inflow and oil leakage of the termination and facilitate operation, maintenance and repair.

The composite bushing uses silicone rubber umbrella skirts as external insulation, which has excellent resistance to pollution flashover, ultraviolet rays and aging.

The product is light in weight, convenient for transportation and installation, and has good explosion-proof performance.



220 kV Outdoor Termiantion With Porcelain Insulator



Brief Introduction

Product Model:
Porcelain-sheathed Outdoor Cable Terminal YJZWY

Executive standards:
IEC 62067 GB/Z 18890

Applicable Environment:
Temperature: -50℃～50℃, suitable for both indoor and outdoor installation,
Altitude: less than 4000 meters

Scope of Application:
Installed on iron towers or brackets, and connected to overhead lines, transformers, electrical switches and other equipment.

Scan the code to view detailed parameters

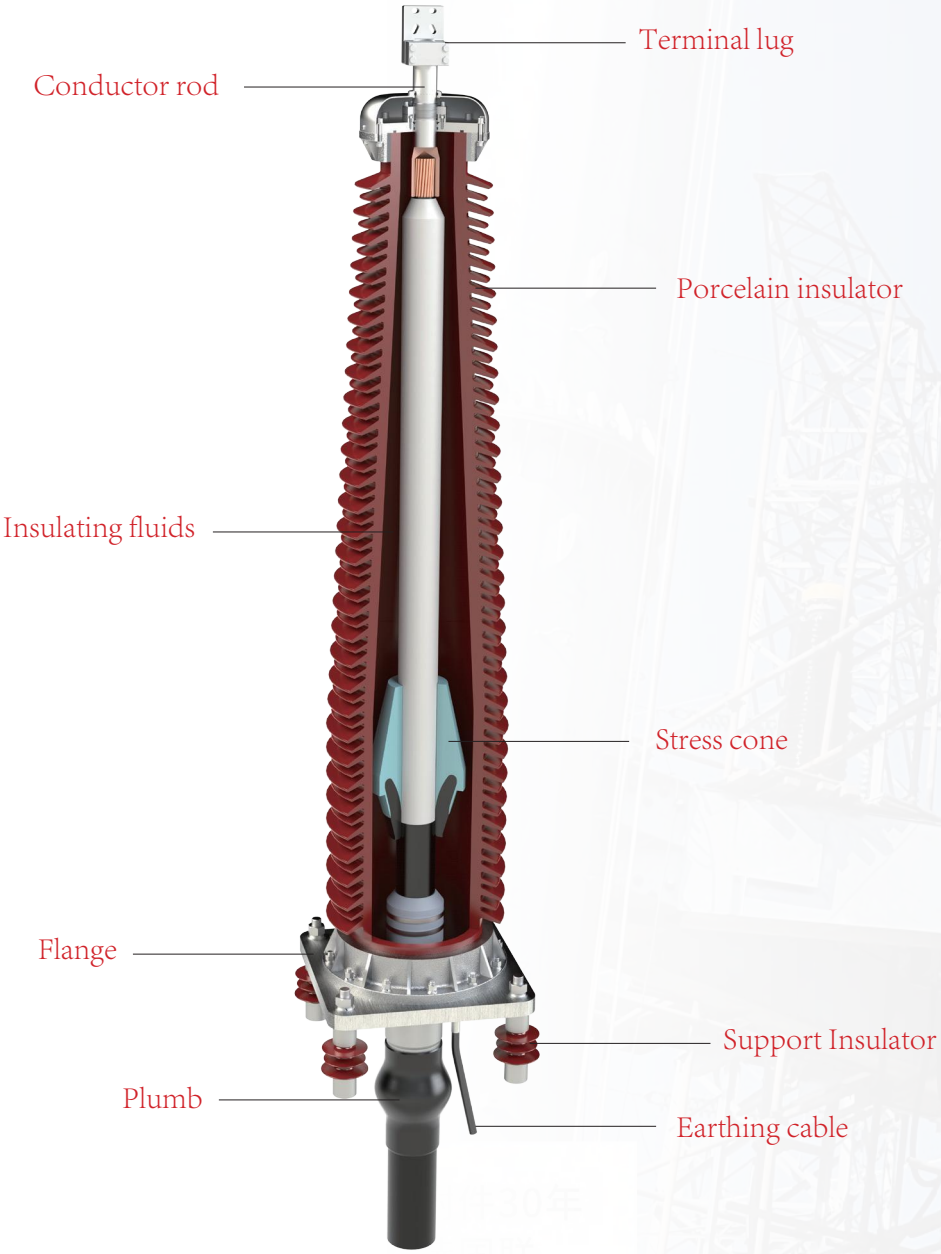
Technical Specification

System rated voltage U0/U	Applicable conductor cross-section	Impulse withstand voltage level (BIL)
127kV/220kV	400-2500mm^2	1050kV

Partial discharge test	Weight
190kV ＜5pC	≈580kg



High-voltage test



Technical Advantages and Features of the Product

The stress cone is formed by injection molding of high-quality imported liquid silicone rubber and designed with finite element optimization, which solves the problem of electric field optimization of the product to ensure the reliability of the product in long-term operation.

The terminal adopts a multi-sealing structure and is detachable, which can solve the problems of water inflow and oil leakage of the terminal and facilitate operation, maintenance and overhaul.

The porcelain insulator is made of high-performance inorganic materials, which has excellent weather resistance, aging resistance, pollution resistance and electric erosion resistance.

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220kV Dry Type GIS/ Transformer Termination



Short type Long type

Brief Introduction

Product models:
Dry-type insulated GIS cable termination YJZGG
Dry-type insulated transformer cable termination YJZYG

Execution standards:
IEC 62067 GB/Z 18890
Dimensions of assembly interface with GIS:
In accordance with IEC 62271-209, GB/T 22381

Applicable environment:
Temperature range: -50℃～50℃, suitable for both indoor and outdoor installation.

Scope of application:
Connection of cables with equipment such as GIS combined electrical appliances and transformers

Scan the code to view detailed parameters



The Fourth Phase New Construction Project of Tongwei Solar in Meishan City



Phase I of Longma Wind Energy 220KV Substation in Tongliao City



Yan'an Ansai Thermal Power Plant Cogeneration Project (Start-up/Standby Transformer)



Shanghai Electric No.1 Main Transformer Project

Technical Specification

System rated voltage U0/U 127kV/220kV	Applicable conductor cross-section 400-2500mm^2	Impulse withstand voltage level (BIL) 1050kV
Partial discharge test 190kV＜5pC	Weight ≈180kg（Short） ≈200kg（Long）	Structural height 620mm / 960mm

Technical Advantages and Features of the Product

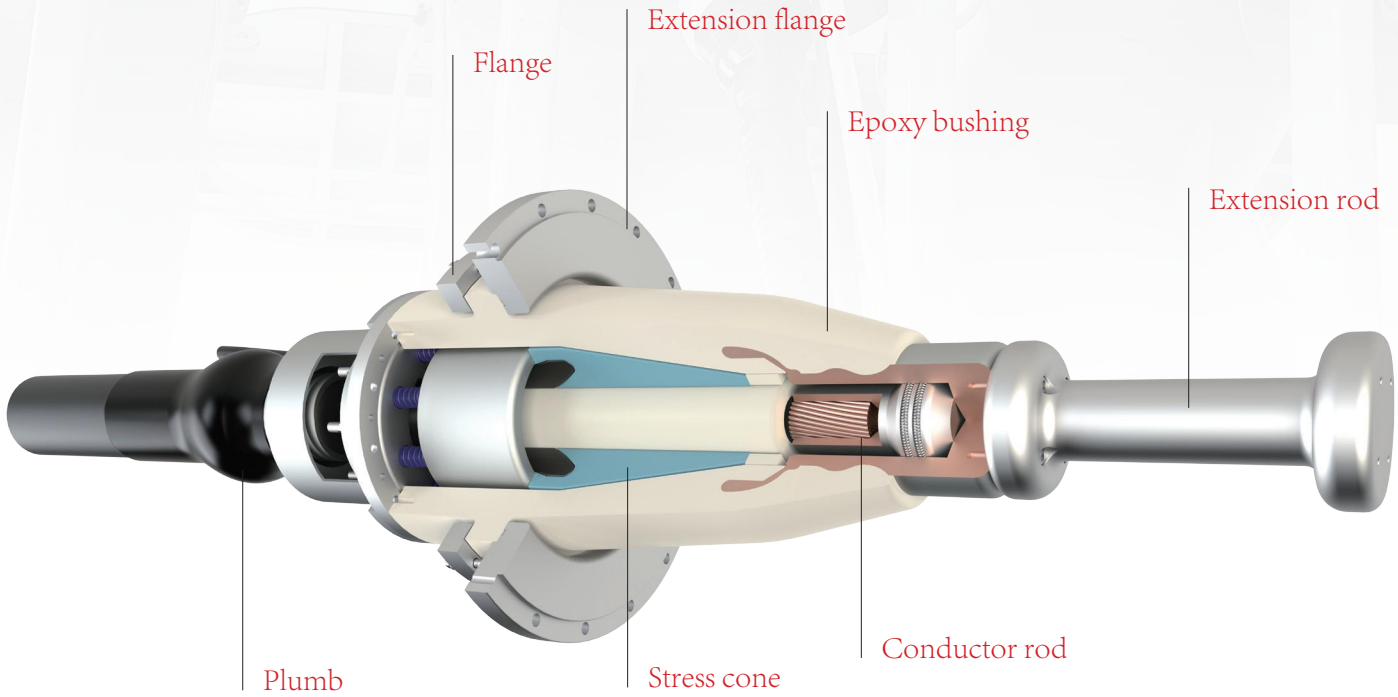
The stress cone is formed by injection molding of high-quality imported liquid silicone rubber and designed with finite element optimization, which solves the problem of electric field optimization of the product to ensure the reliability of the product during long-term operation.

The terminal adopts a fully sealed structure, and the connection between the conductor and the hardware is made by silver-plated contact fingers, ensuring that the terminal has good current-carrying capacity.

The terminal is of a dry-type structure with no filling liquid at all, avoiding the risk of oil seepage and leakage during product operation.

A spring-pressed structure for the stress cone is adopted to ensure the long-term stability of the interface pressure between the stress cone and the epoxy base, providing a guarantee for the long service life of the product.

The product has a reasonable structural design, featuring small size, light weight, and quick and convenient installation.



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220kV Joint (with Copper Housing)

Brief Introduction

Product models:
One piece joint with screen or metal sheath interruption YJJJI2
One-piece joint without screen or metal sheath interruption YJJTI2

Executive standards:
IEC 62067　GB/Z 18890

Applicable environment:
Temperature: -50℃～50℃

Scope of application:
For connecting two sections of cables laid in direct burial, joint wells or tunnels

Technical Specification

System rated voltage U0/U	Applicable conductor cross-section	Impulse withstand voltage level (BIL)
127kV/220kV	400-2500mm^2	1050kV

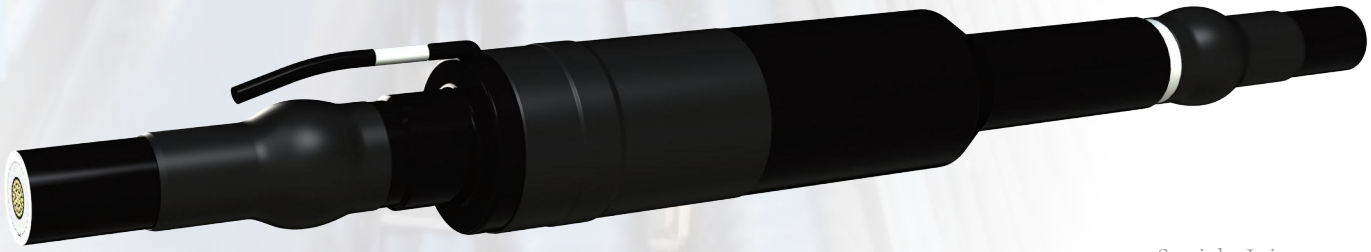
Partial discharge test	Weight
190kV＜5pC	≈90kg

Technical Advantages and Features of the Product

The stress cone is formed by injection molding of high-quality imported liquid silicone rubber and designed with finite element optimization, which solves the problem of electric field optimization of the product to ensure the reliability of the product during long-term operation.

The main insulation of the joint is an integral prefabricated structure, where the high-voltage shielding of the conductor, insulation, and insulation shielding are prefabricated into an integral component, featuring a compact and simple structure that is easy to install.

The outer shell adopts a high-strength copper protective box, which has high mechanical strength and good waterproof performance.



Straight Joint

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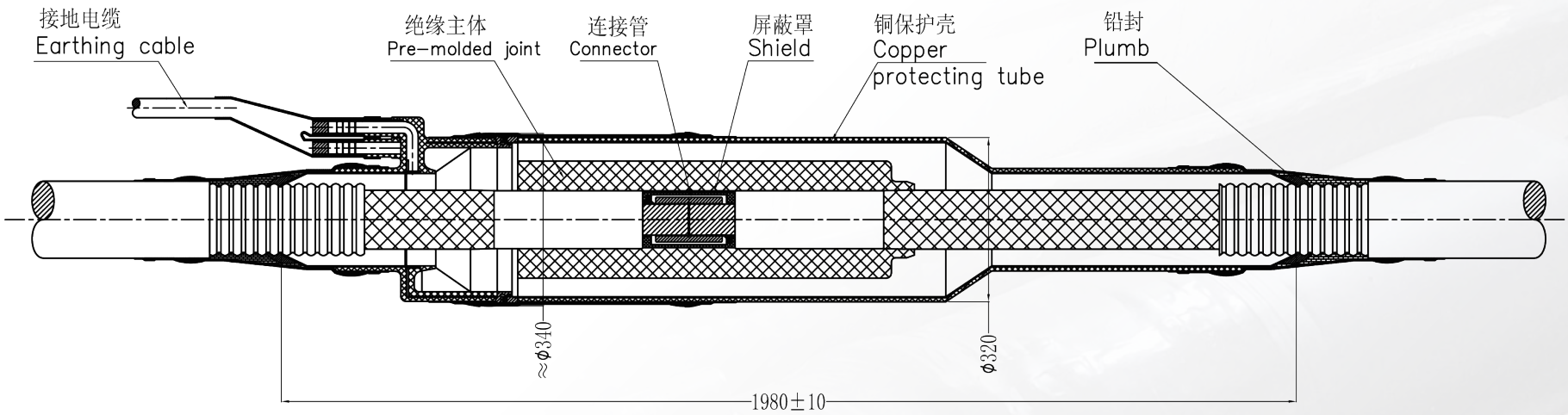



Sectionalizing Joint

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220kV Joint (With Fiber Glass Box)

Brief Introduction

Product models:
One-piece joint with screen or metal sheath interruption YJJJI1
One-piece joint without screen or metal sheath interruption YJJTI1

Executive standards:
IEC 62067　GB/Z 18890

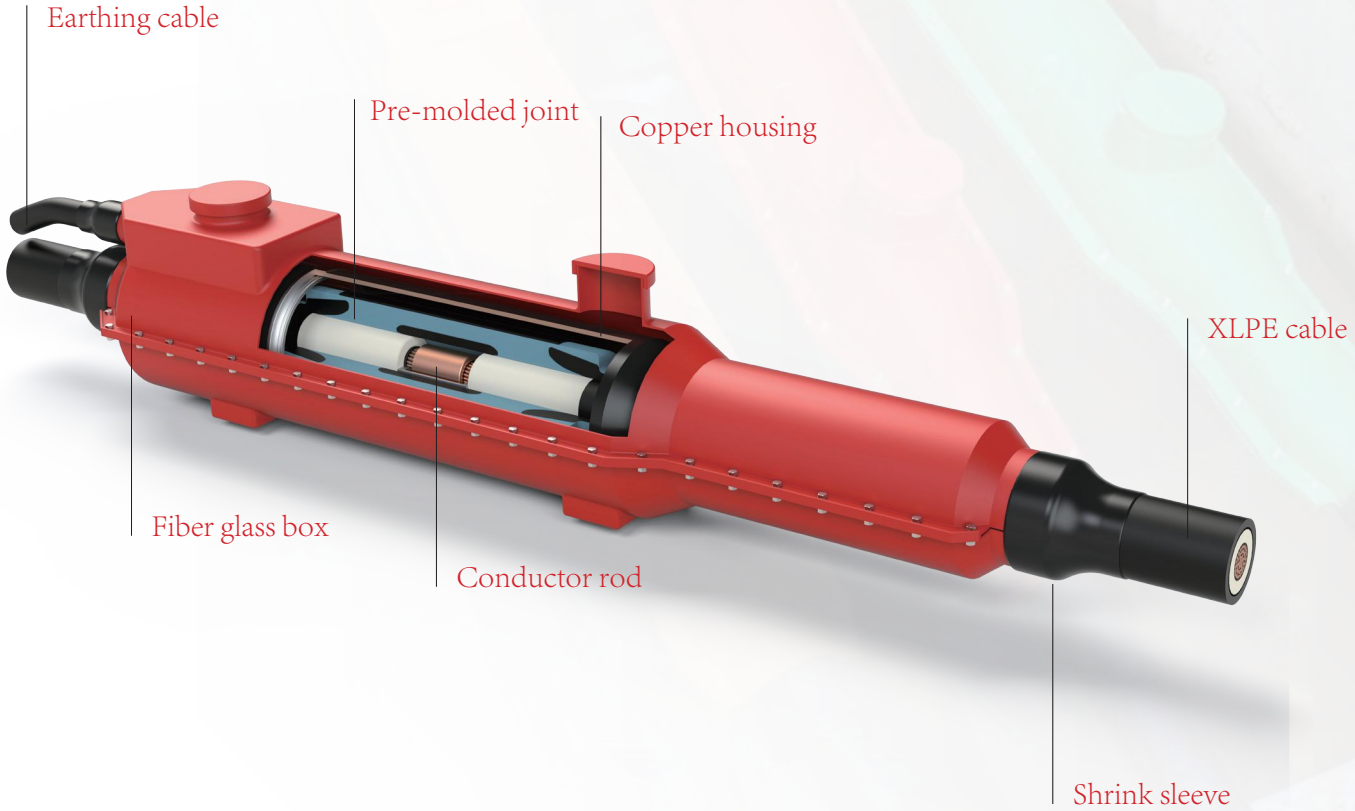
Applicable environment:
Temperature: -50℃～50℃

Scope of application:
For connecting two sections of cables laid in direct burial, joint wells or tunnels

Technical Specification

System rated voltage U0/U	Applicable conductor cross-section	Impulse withstand voltage level (BIL)
127kV/220kV	400-2500mm^2	1050kV

Partial discharge test	Weight
190kV ＜5pC	≈310kg



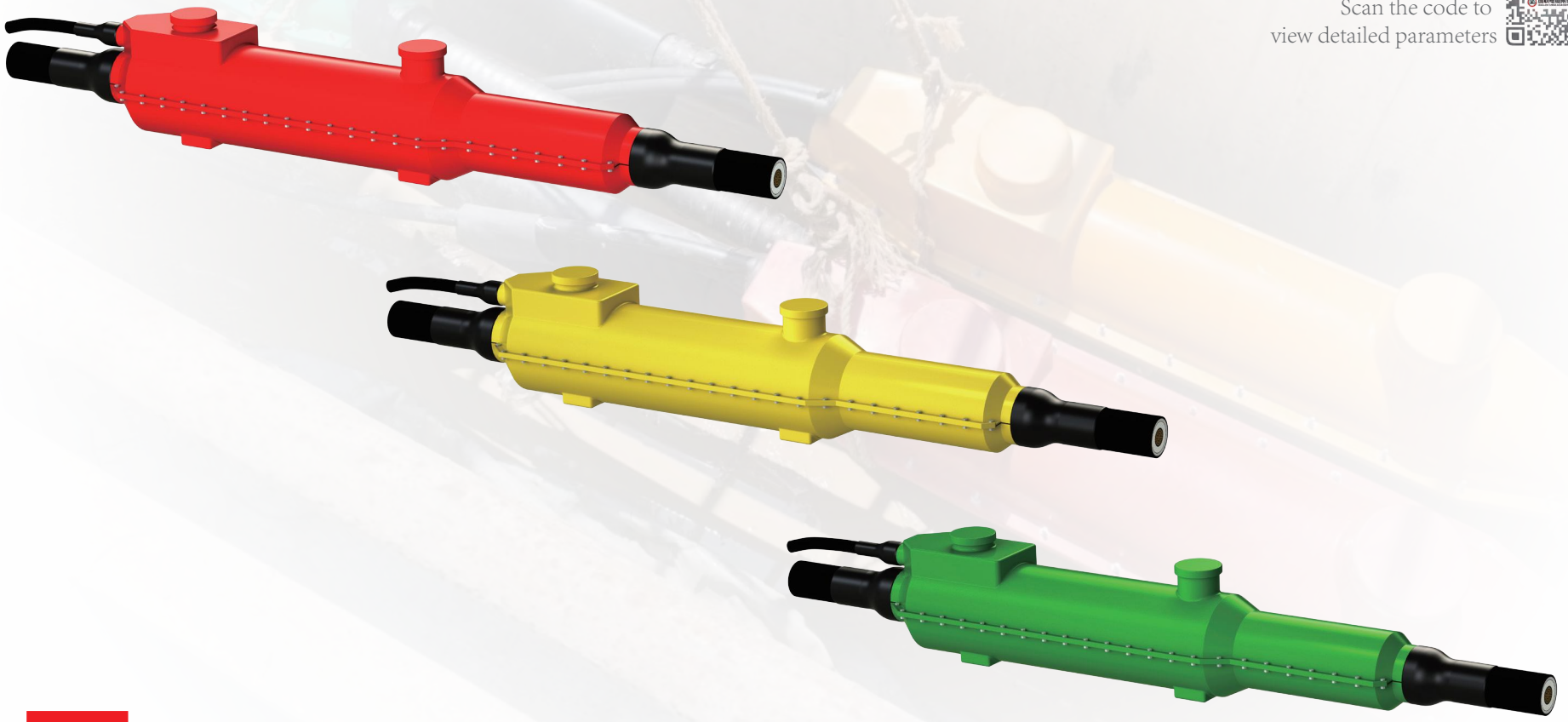
Technical Advantages and Features of the Product

The stress cone is formed by injection molding with high-quality imported liquid silicone rubber and designed with finite element optimization, which solves the problem of electric field optimization of the product to ensure the reliability of the product during long-term operation.

The main insulation of the joint is an integral prefabricated structure. The high-voltage shielding of the conductor, insulation, and insulation shielding are prefabricated into an integral component, featuring a compact and simple structure that is easy to install.

On the basis of the copper protective box, the outermost layer adopts a glass fiber reinforced plastic protective box, and high-voltage insulating waterproof glue is poured inside, which enhances the performance of corrosion resistance, explosion protection, waterproofing and resistance to mechanical damage.

Scan the code to
view detailed parameters



66-138 kV Outdoor Termination With Composite Insulator



Brief Introduction

Product model:
Composite outdoor cable termination YJZWFY

Executive standards:
IEC 60840 GB/T 11017

Applicable environment:
Temperature: -50℃～50℃, suitable for both indoor and outdoor installation
Altitude: less than 4000 meters

Scope of application:
Installed on iron towers or brackets, and connected to overhead lines, transformers, electrical switches and other equipment

Scan the code to view detailed parameters

Technical Specification

System rated voltage U0/U	Applicable conductor cross-section	Impulse withstand voltage level (BIL)
110kV	240-2500mm^2	550kV

Partial discharge test	Weight	Creepage distance	Dry arc distance
96kV＜5pC	≈130kg	⩾43000mm	⩾1250mm



New Construction Project of Wangjiashan 110KV Booster Station
Pingchuan District, Baiyin City, Gansu Province

Technical Advantages and Features of the Product

The stress cone is formed by injection molding with high-quality imported liquid silicone rubber and designed with finite element optimization, which solves the problem of electric field optimization of the product to ensure the reliability of the product during long-term operation.

The terminal adopts a multi-seal structure and is detachable, which can solve the problems of water inflow and oil leakage of the terminal and facilitate operation, maintenance and overhaul.

The composite sleeve uses silicone rubber umbrella skirts as external insulation, which has excellent pollution flashover resistance, ultraviolet resistance and aging resistance.

The product is light in weight, convenient for transportation and installation, and has good explosion-proof performance.

66-138 kV Outdoor Termination with Porcelain Insulator



Brief Introduction

Product model:
Porcelain-sleeved outdoor cable termination YJZWY

Executive standards:
IEC 60840 GB/T 11017

Applicable environment:
Temperature: -50℃～50℃, suitable for both indoor and outdoor installation
Altitude: less than 4000 meters

Scope of application:
Installed on iron towers or brackets, and connected to overhead lines, transformers, electrical switches and other equipment

Scan the code to view detailed parameters

Technical Specification

System rated voltage U0/U	Applicable conductor cross-section	Impulse withstand voltage level (BIL)
110kV	240-2500mm^2	550kV

Partial discharge test	Weight	Creepage distance	Dry arc distance
96kV＜5pC	≈260kg	⩾43000mm	⩾1250mm



Yulin Dabaochang 110KV Transmission Line Project

Technical Advantages and Features of the Product

The stress cone is molded from high-quality EPDM (Ethylene Propylene Diene Monomer) rubber and designed with finite element optimization, which solves the problem of electric field optimization of the product to ensure the reliability of long-term operation.

The terminal adopts a multi-seal structure and is detachable, which can solve the problems of water inflow and oil leakage of the terminal and facilitate operation, maintenance and overhaul.

The porcelain sleeve is made of high-performance inorganic materials, featuring excellent weather resistance, aging resistance, pollution resistance and electric erosion resistance.

Salt-fog resistant products are available, making them the best choice for special operating environments such as offshore areas.

66-138kV Silicone Rubber Dry-Type Outer Door Termination

Brief Introduction

Scan the code to view detailed parameters

Product model:
Silicone rubber dry-type cable termination YJZWG

Implementation standards:
IEC 60840, GB/T 11017

Applicable environment:
Temperature range -50℃~50℃;
suitable for both indoor and outdoor installation;
altitude less than 4000 meters

Application scope:
Direct connection with overhead lines on iron towers, or connection between substations and equipment such as transformers and electrical switches





Voltage class	Maximum operating voltage	Creepage distance	Pollution resistance class	Flashover distance	Terminal weight
138kV	145kV	>4500mm	Ⅳ	>1470	≈32
110kV	126kV	>4300mm	Ⅳ	>1370	≈30
66kV	72.5kV	>2500mm	Ⅳ	>1030	≈25

Technical Advantages and Features of the Product

Reliable Quality:
Made of imported silicone rubber through integral one-time molding, it has excellent sealing performance and reliable insulation performance, with low partial discharge, large surface leakage distance and strong pollution resistance, ensuring safe operation in harsh conditions and highly polluted areas.

Simple Installation:
It can be installed at multiple angles, and due to its small size and light weight, it is more suitable for installation on iron towers.

Maintenance-free:
The dry-type terminal requires no filling fluid, eliminating the phenomenon of leakage.



Silicone Rubber Dry-Type Outer Door Termination



Silicone Rubber Dry-Type Outer Door Termination (type- Ⅱ)

66-138kV Dry Type GIS/ Transformer Termination



Short Type　　Long Type

Brief Introduction

Product models:
Dry-type insulated GIS cable termination YJZGG
Dry-type insulated transformer cable termination YJZYG

Executive standards:
IEC 60840 GB/T 11017

Interface dimensions for assembly with GIS:
In accordance with IEC 62271-209, GB/T 22381

Applicable environment:
Temperature: -50℃～50℃, suitable for both indoor and outdoor installation

Scope of application:
Connection of cables with GIS combined electrical appliances, transformers and other equipment

Scan the code to view detailed parameters

Technical Specification

System rated voltage U0/U	Applicable conductor cross-section	Impulse withstand voltage level (BIL)
110kV	240-2500mm^2	550kV

Partial discharge test	Weight	Structural height
190kV ＜5pC	≈70kg（Short） ≈75kg（Long）	470mm /757mm



110kV Zongheng Group Fengnan Iron and Steel Project

Technical Advantages and Features of the Product

The stress cone is formed by injection molding with high-quality imported liquid silicone rubber and designed with finite element optimization, which solves the problem of electric field optimization of the product to ensure the reliability of long-term operation.

The terminal adopts a fully sealed structure, and the connection between the conductor and the hardware fitting uses a silver-plated contact finger connection to ensure that the terminal has good current-carrying capacity.

The terminal is of a dry-type structure with no filling liquid at all, avoiding the risk of oil seepage and leakage during product operation.

A spring compression structure for the stress cone is adopted to ensure the long-term stability of the interface pressure between the stress cone and the epoxy base, providing a guarantee for the long service life of the product.The product has a reasonable structural design, with small volume, light and quick installation.

66-138kV Joint (With Copper Housing)

Brief Introduction

Product models:
One-piece joint with screen or metal sheath interruption YJJJI2
One-piece joint without screen or metal sheath interruption YJJTI2

Executive standards:
IEC 60840 GB/T 11017

Applicable environment:
Temperature: -50℃～50℃

Scope of application:
For connecting two sections of cables laid in direct burial, joint wells or tunnels

Technical Advantages and Features of the Product

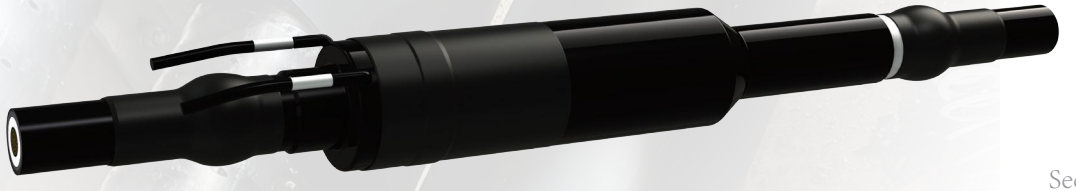
The stress cone is formed by injection molding with high-quality imported liquid silicone rubber and designed with finite element optimization, which solves the problem of electric field optimization of the product to ensure the reliability of long-term operation.

The main insulation of the joint is an integral prefabricated structure. The high-voltage shielding of the conductor, the insulation, and the insulation shielding are prefabricated into an integral part, featuring a compact and simple structure for easy installation.

The outer shell adopts a high-strength copper protective box, which has high mechanical strength and good waterproof performance.



Straight joint



Sectionalizing joint

Technical Specification

System rated voltage U0/U	Applicable conductor cross-section	Impulse withstand voltage level (BIL)
110kV	240-2500mm^2	550kV

Partial discharge test	Weight
96kV ＜5pC	≈85kg

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66-138kV Joint (With Fiber Glass Box)



Alxa Energy 170MW Distributed Wind Power Project

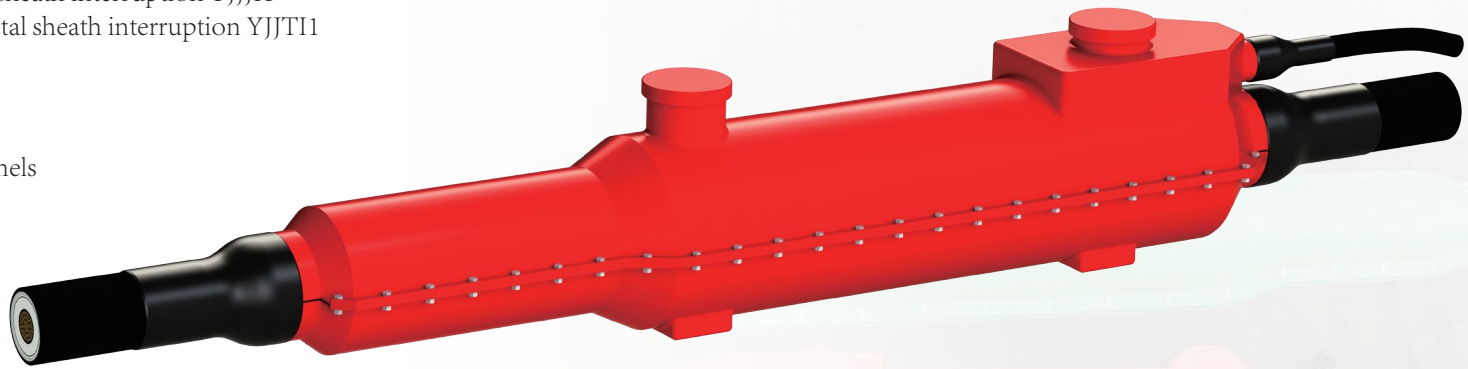
Brief Introduction

Product models:
One-piece joint with screen or metal sheath interruption YJJJI1
One-piece joint without screen or metal sheath interruption YJJTI1

Scope of application:
For connecting two sections of cables
laid in direct burial, joint wells or tunnels

Executive standards:
IEC 60840 GB/T 11017

Applicable environment:
Temperature: -50℃～50℃



Technical Specifications

System rated voltage U0/U	Applicable conductor cross-section	Impulse withstand voltage level (BIL)
110kV	240-2500mm^2	550kV

Partial discharge test	Weight
96kV ＜5pC	≈105kg

Technical Advantages and Features of the Product

The stress cone is formed by injection molding with high-quality imported liquid silicone rubber and designed with finite element optimization, which solves the problem of electric field optimization of the product to ensure the reliability of its long-term operation.

The main insulation of the joint is an integral prefabricated structure. The high-voltage shielding of the conductor, the insulation, and the insulation shielding are prefabricated into an integral part, featuring a compact and simple structure for easy installation.

On the basis of the copper protective box, the outermost layer is a glass fiber reinforced plastic protective box, and high-voltage insulating waterproof glue is poured inside, which enhances the performance of corrosion resistance, explosion protection, waterproofing and resistance to mechanical damage.

Scan the code to
view detailed parameters

Link Box

Scan the code to
view detailed parameters

Brief Introduction

Product models:
Direct grounding box: SLB
Protective grounding box: PLB
Cross-connection grounding box: CLB

Applicable environment:
Suitable for indoor, outdoor, manholes or tunnels

Scope of application:
This series of products is suitable for sheath grounding protection of 35kV-220kV cable lines.The products can be adapted to 50-400mm^2 cross-section grounding cables and coaxial cables, and the cross-section can be expanded.

Technical Advantages and Features of the Product

Adopt a highly corrosion-resistant 304 stainless steel metal shell.

Bolt fastening is used for connection, making inspection and maintenance convenient.

The surge arester can be replaced.



Direct Earthing Link Box（SLB）

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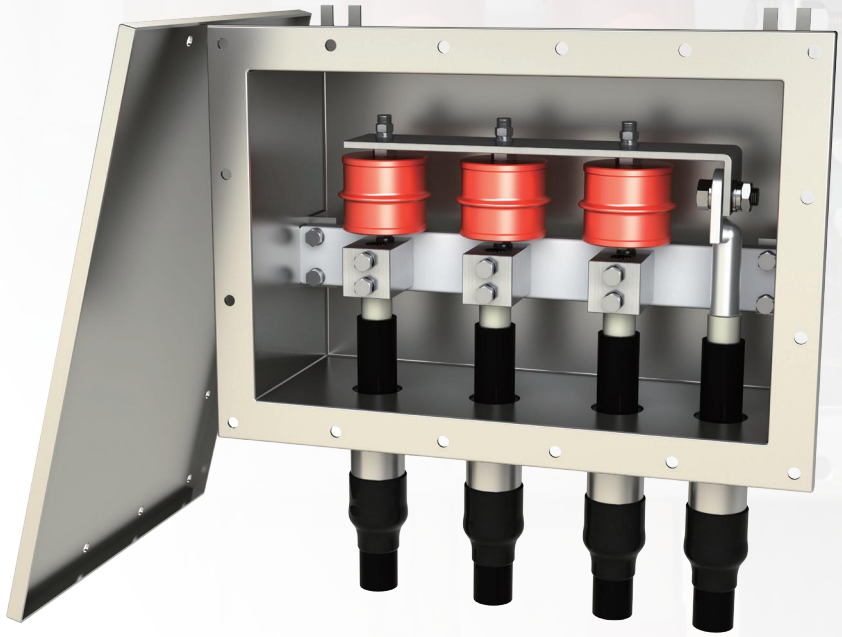
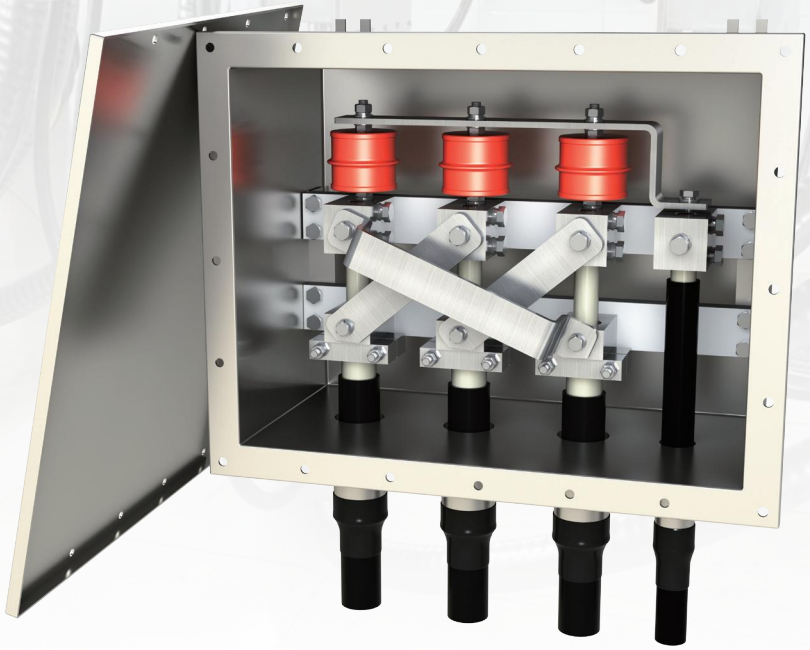


Protective Earthing Link Box：PLB



Cross Linked Earthing Box：CLB

Earthing Cable

Brief Introduction

Specification: 50-400mm^2

Model: DV, YJV, YJY

Conductor: Non-compacted or compacted wire core

Insulation material: XLPE; outer sheath is made of PVC or PE material



Coaxial Earthing Cable

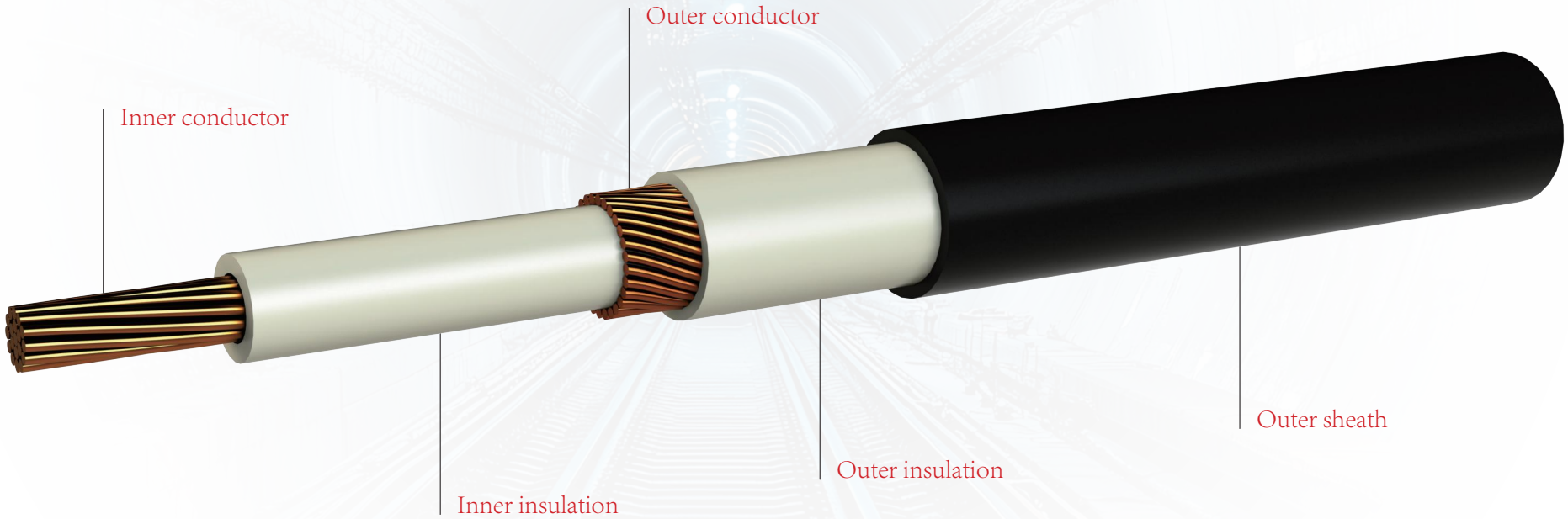
Brief Introduction

Specification: 50-400mm^2

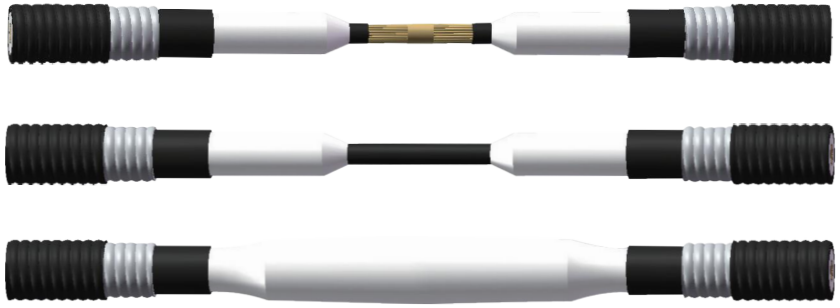
Model: VOV, YJOV, YJOY

Conductor: Non-compacted or compacted wire core

Insulation material: XLPE; outer sheath is made of PVC or PE material



10 - 110 kV Fusion Type Joint



Executive Standard

GB/T 12706 "Extruded Insulation Power Cables and Accessories with Rated Voltage from 1kV (Um=1.2kV) to 35kV (Um=40.5kV)"

IEC 60502 "Extruded Insulation Power Cables and Accessories with Rated Voltage from 1kV (Um=1.2kV) to 30kV (Um=36kV)"

GB/T 11017 "Cross-linked Polyethylene Insulated Power Cables and Their Accessories with Rated Voltage of 110kV"

IEC 60840 "Test Methods and Requirements for Extruded Insulation Power Cables and Their Accessories with Rated Voltage above 30kV (Um=36kV) up to 150kV (Um=170kV)"

Scan the code to view detailed parameter

Performance Parameter

Test items / Voltage level	Rated voltage	Partial discharge	Lightning impulse withstand voltage	Power frequency withstand voltage	Maximum voltage	Thermal cycle voltage test	Rain withstand voltage test	Impulse margin test
10kV	8.7/15	＜10pC.15V	95kV.±10次	39kV.5min	/	/	/	/
20kV	12/20	＜10pC.20V	125kV.±10次	54kV.5min	/	/	/	/
35kV	26/35	＜10pC.45V	200kV.±10次	117kV.5min	/	/	/	/
66kV	48/66	＜5pC.54V	450kV.±10次	120kV.30min	72.5kV	96kV,100℃ A total of 20 cycles are performed	140kV 1min	500kV±10times
110kV	64/110	＜5pC.96V	550kV.±10次	160kV.30min	126kV	128kV,100℃ A total of 20 cycles are performed	185kV 1min	650kV±10times

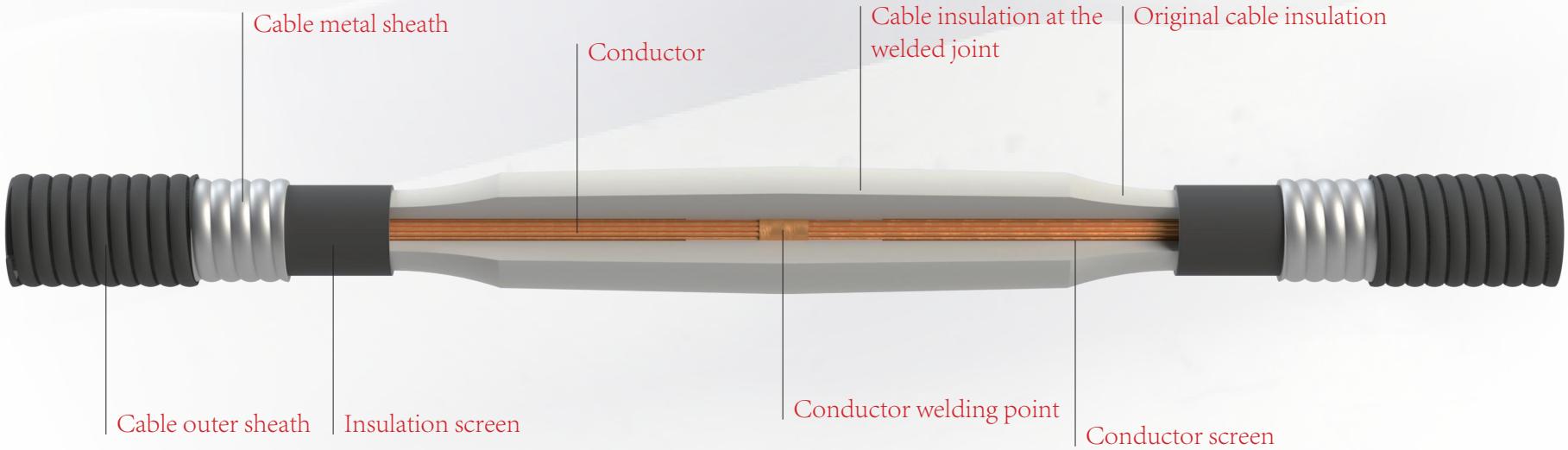
Technical Advantages and Features of the Product

Excellent Insulation Performance:
It adopts XLPE (cross-linked polyethylene) with an air-gap-free interface fusion bonding, same as the cable insulation. Structurally, it forms an integrated whole consistent with the cable without obvious joint characteristics. The insulation strength is the same as that of the original cable, featuring higher electrical insulation and stable, durable

Operation performance:
Equal-Diameter Connection Saves Space
It is manufactured to have an outer diameter approximately equal to or the same as that of the cable. Moreover, the CMJ can be installed at special positions such as cable bends and high-altitude suspension points, without occupying much space.

High Mechanical Strength:
The conductor cores are fusion-welded, allowing the cable at the repaired part to be bent and dragged.

Superior Sealing Performance:
On-site layered fusion bonding is adopted, with seamless fusion between the inner and outer semiconducting layers, the insulation body and the original cable (no interface), resulting in excellent waterproof performance.



Installation

Raw material quality control:
High-quality imported ultra-purified and ultra-smooth crosslinkable cable insulation materials and semi-conductive materials are selected, with excellent performance.

Conductor connection - using exothermic welding method

Compatibility:
The welding process eliminates the stress generated after the fusion of insulation and semi-conductive materials.

Protective, heating and heat dissipation equipment are equipped during the installation process.

The conductor resistance value after welding is consistent with that of the cable body conductor, and the conductor tensile strength is close to that of the cable body.

The 110kV mold-cast fusion-welded intermediate joint can be made in cable tunnels, direct burial sections and joint wells, and has good water-proof and sealing performance.

A critical step in joint manufacturing requires the setup of Mobile Purification Treatment Device for Installing High-Voltage Cable Accessories. A miniaturized extruder and closed forming mold are used. The insulating material for restoring the insulation layer is stored in a hopper. When extruding and injecting the insulation, the quality requirements for the restored insulation layer must be ensured.



Stripping the cable



Core fusion splicing

66 kV Separable Connector



66kV Rear Connector



66kV Front Connector

Brief Introduction

Product model: Q J(front connection) HJ (rear connection)

Applicable environment: Temperature -50℃~+50℃

Executive standard: IEC60840
(interface dimensions in accordance with EN50180 & 50181)

Scope of application:
The 72.5kV shielded separable connector is applied in power systems for cable connection of 66kV power equipment to achieve fully insulated, fully sealed and shielded separable connection. It is mainly used for incoming and outgoing cable connections and branches of box-type substations in 66kV offshore wind power projects, as well as incoming and outgoing cable connections and branches of high-voltage ring main units.

Technical Advantages and Features of the Product

Reliable Quality:
High-quality ethylene-propylene rubber or silicone rubber is adopted, and internationally advanced injection insulation layer technology is introduced. The product has excellent electrical performance, as well as resistance to tearing, ozone and corrosion, and high mechanical strength.

The connector is a fully insulated, fully sealed and fully shielded product.

Technical Specification

System rated voltage U0/U	Maximum operating voltage	Rated current
38/66kV	72.5kV	2500A

30-minute power frequency withstand voltage	Lightning impulse	Partial discharge level
95kV	325kV	67kV ⩽5Pc

10-35kV Separable Connector

Brief Introduction

Scan the code to view detailed parameter

Product model: QJ (front connection) H (rear connection)

Applicable environment: Temperature -50℃~+50℃

Executive standard: GB/T12706
(interface dimensions in accordance with EN50180 & EN50181)

Scope of application:
10-35kV European-style T-joints (front joints, rear joints) are used in the main network system of cable distribution boxes or as incoming and outgoing cable joints of ring main units. They can not only connect high-voltage bushings and multi-unit combined sockets, but also be combined with busbar bushings and rear T-joints to form multi-circuit cable branches, and can be connected with arresters at the rear.



European-style T-type Rear-plugged Arrester



European-style T-type Rear plug



European-style T-type Front plug



American-style T-joint



American-style elbow head



Fabrication of T-type joints for 10kV capacity expansion and transformation of Zhonglian Data 220KV Substation

Technical Advantages and Features of the Product

High-quality ethylene-propylene rubber or silicone rubber is adopted, and internationally advanced injection insulation layer technology is introduced.

The product has excellent electrical performance, as well as resistance to tearing, ozone and corrosion, and high mechanical strength.

The connector is a fully insulated, fully sealed and fully shielded product.

The cable distribution box features a small structural size, which meets the installation space requirements of ring main units.

The outer shielding layer is uniform, with a grounding resistance of less than 5000Ω/cm. It effectively ensures that the outer surface of the connector maintains zero potential, so as to guarantee the personal safety of operation and maintenance personnel.

Technical Specification

System rated voltage U0/U	Maximum operating voltage	Rated current
8.7/15kV 12/20kV 26/35kV	17.5kV 24kV 40.5kV	630A (apply to 25-630mm^2)
5-minute power frequency withstand voltage	**Lightning impulse**	**Partial discharge level**
39kV 54kV 117kV	95kV 125kV 200kV	67kV ≤10pC (at 1.5 times U0)

DC 75kV Dust Filter Cable Termination

Technical Specification

Voltage class	DC withstand voltage	pollution resistance class
DC 75kV	105kV,15min	IV

Surface leakage distance	Weight of prefabricated terminal	Weight of pedestal terminal
＞1300mm	≈10kg	＞30kg

Brief Introduction

Product Model: GYWZ75

Executive Standard: GB/T 12706

Applicable Environment: Temperature -50℃~+50℃, altitude less than 3000m

Scope of Application:
Used for electrostatic precipitation in power plants, and for supporting use with dust filter cables or other cables in industries such as metallurgy and chemical engineering.



Dust filter cable terminal

Technical Advantages and Features of the Product

Adopts an internal stress cone structure.

Ensures the adaptation range of the insulation outer diameter of the cable core and guarantees the interface clamping force.

Ensures no deformation of the stress control part.

Features good grounding and no potential floating.

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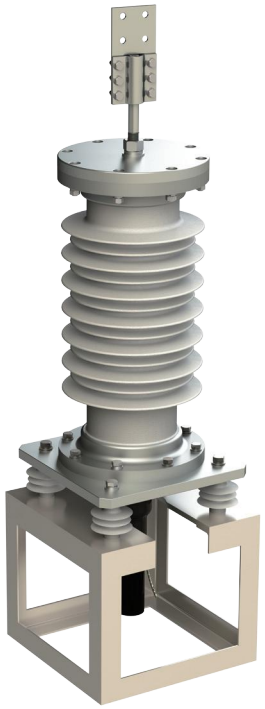
35kV Outdoor Termination With Composite/Porcelain Insulator



35kV Outdoor termination with composite insulator



35kV Outdoor termination with porcelain insulator

Brief Introduction

Scan the code to view detailed parameter

Product Model:
Composite outdoor cable terminal YJZWF
Porcelain-sheathed outdoor cable terminal YJZWC

Product Features:
High mechanical strength, good insulation performance, and strong pollution resistance

Scope of Application:
Directly connected to overhead lines on iron towers, or connected to equipment such as transformers and electrical switches in substations

Applicable Environment:
Temperature: -50℃~+50℃; applicable to both indoor and outdoor locations; altitude less than 4000m

Technical Specification

Voltage class	DC withstand voltage	Pollution resistance class
35kV	40.5kV	IV

Surface leakage distance	Weight of prefabricated terminal	Weight of pedestal terminal
＞1300mm	≈35kg	≈80kg

1-35kV Cold-Shrinkable Cable Termination



Brief Introduction

Executive Standards: IEC 60502, GB/T 12706

Scope of Application: The following are nominal cross-sections, which can be expanded according to the actual situation of the project

Rated voltage	Applicable cable cross-section
26/35kV	25~1200mm^2
12/20kV,18/20（30）kV	25~800mm^2
8.7/10kV,8.7/15kV	16-630mm^2
0.6/1kV	16-630mm^2



Copper/aluminum terminals

GB/T 14315 connecting fittings are adopted, which have efficient conductive performance and can realize reliable conductive connection between conductors and equipment.

Cold-shrink insulation tube

Made of liquid silicone rubber by injection molding, with excellent mechanical strength and electrical performance.

Cold-shrink three-finger sleeve

Made of imported liquid silicone rubber by injection molding, with excellent electrical and mechanical properties.

Tinned copper braided tape

Woven from multiple strands of high-purity oxygen-free copper wires (or tinned copper wires), it is flexible, reliable, and has strong corrosion resistance and oxidation resistance.

1-3kV cold-shrinkable cable termination

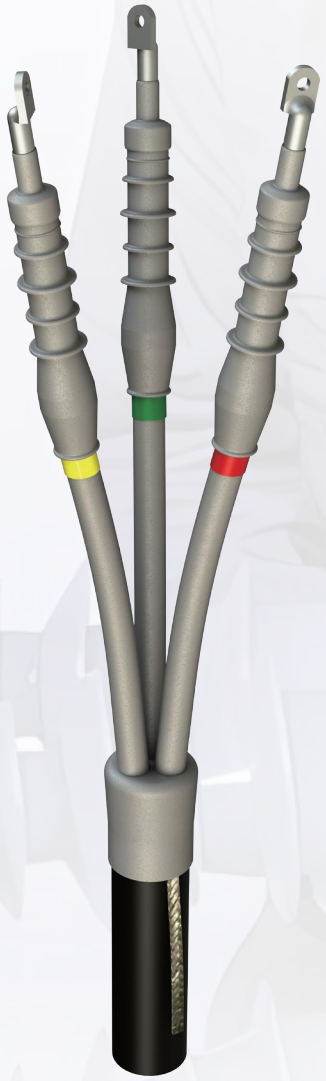
Technical Advantages and Features of the Product

Reliable Quality:
The product adopts imported high-elasticity silicone rubber, with the prefabricated stress cone formed by one-time injection molding. This ensures a tight fit between the accessory and the cable, guaranteeing uniform electric field and reliable insulation.

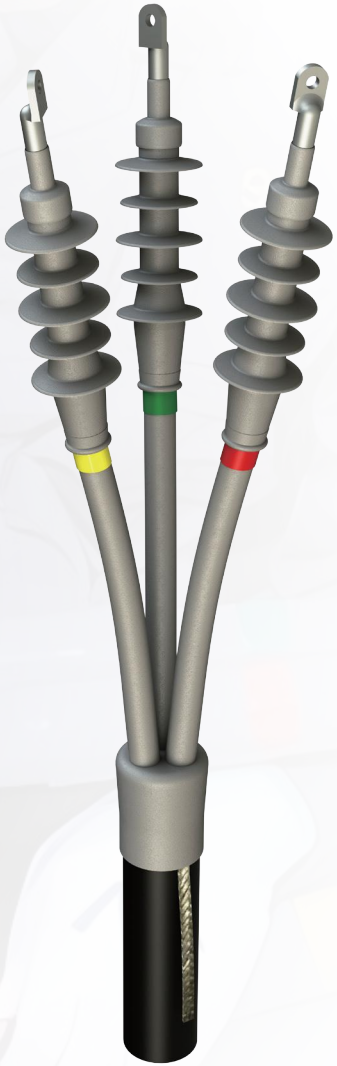
Wide Applicability:
It has excellent anti-aging, cold-resistant and high-temperature-resistant (-50℃~+50℃) properties, as well as strong resistance to electrical erosion and ultraviolet rays, making it suitable for harsh environments such as high-pollution areas.

Convenient Installation:
It adopts cold-shrink technology, requiring no flame or special tools. It can be easily installed by following the instructions, and is applicable to flammable and explosive places.

Scan the code to
view detailed parameter



10-35kV cold-shrinkable indoor termination
(Model：NLS)



10-35kV cold-shrinkable outdoor termination
(Model：WLS)

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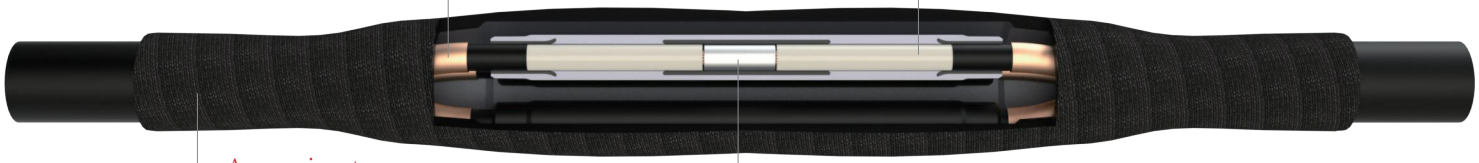
1-35kV Cold-Shrinkable Joint

Grounding wire

Tinned copper braided tape, woven from multiple strands of high-purity oxygen-free copper wire (or tinned copper wire), is flexible, reliable, and has strong corrosion resistance and oxidation resistance.

Cold-shrink main body

Made of imported liquid silicone rubber through injection molding, it features high insulation resistance, high breakdown strength, high tear resistance, high temperature resistance and so on.



Armoring tape

It features high tensile strength, strong creep resistance, corrosion resistance, high temperature resistance and so on.

Copper/Aluminum Connecting Tube

Adopting the connecting fittings specified in GB/T 14315, it features excellent electrical conductivity, high conductivity, high reliability and strong corrosion resistance, enabling reliable connection of conductors.



Main components

Brief Introduction

Product model: JLG

Execution standard: IEC60502, GB/T12706

Scope of application:
The following are nominal cross-sections, which can be expanded according to the actual situation of the project

Rated voltage	Applicable cable cross-section
26/35kV	25~1200mm^2
12/20kV,18/20（30）kV	25~800mm^2
8.7/10kV,8.7/15kV	16-630mm^2
0.6/1kV	16-630mm^2

1-35kV Heat-Shrinkable Cable Termination

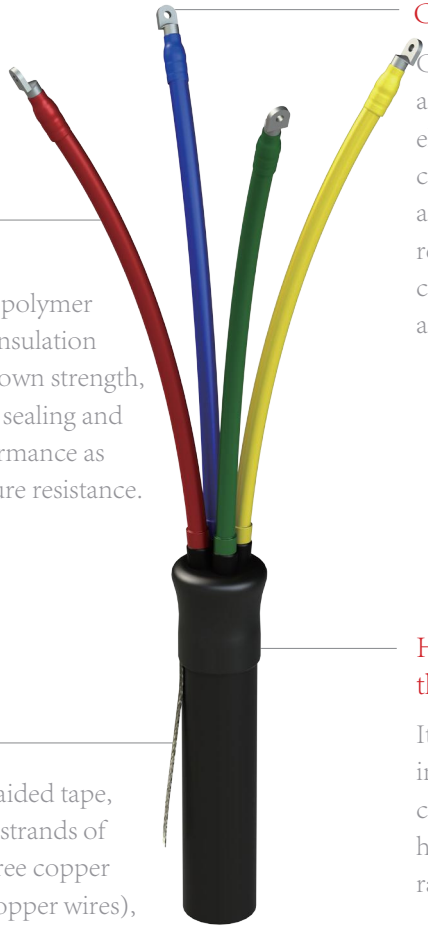


Brief Introduction

Executive standards: IEC60502, GB/T12706

Scope of application: The following are nominal cross-sections, which can be expanded according to the actual situation of the project

Rated voltage	Applicable cable cross-section
26/35kV	25~1200mm^2
12/20kV,18/20（30）kV	25~800mm^2
8.7/10kV,8.7/15kV	25~1000mm^2
0.6/1kV	16-630mm^2



Copper/aluminum terminals

GB/T 14315 connecting fittings are adopted, which have good electrical conductivity, high conductivity, high reliability and strong corrosion resistance, realizing reliable conductive connection between conductors and equipment.

Heat-shrinkable Insulation Tube

Made of cross-linked polymer materials, it has high insulation resistance and breakdown strength, and offers insulation, sealing and moisture-proof performance as well as high temperature resistance.

Heat-shrinkable three-finger sleeve

It features phase-separated insulation, tight sealing and close fitting, and can resist high and low temperatures ranging from -55℃ to 125℃.

Grounding Wire

Tin-plated copper braided tape, woven from multiple strands of high-purity oxygen-free copper wires (or tin-plated copper wires), is flexible, reliable, and boasts strong corrosion resistance and oxidation resistance.

1-3kV heat-shrinkable cable termination

Scan the code to view detailed parameter

Technical Advantages and Features of the Product

Fast shrinkage

No cracking

Sealing and flame retardancy

Excellent weather resistance



10-35kV heat-shrinkable indoor termination
(Model：NRS)



10-35kV heat-shrinkable outdoor termination
(Model：WRS)

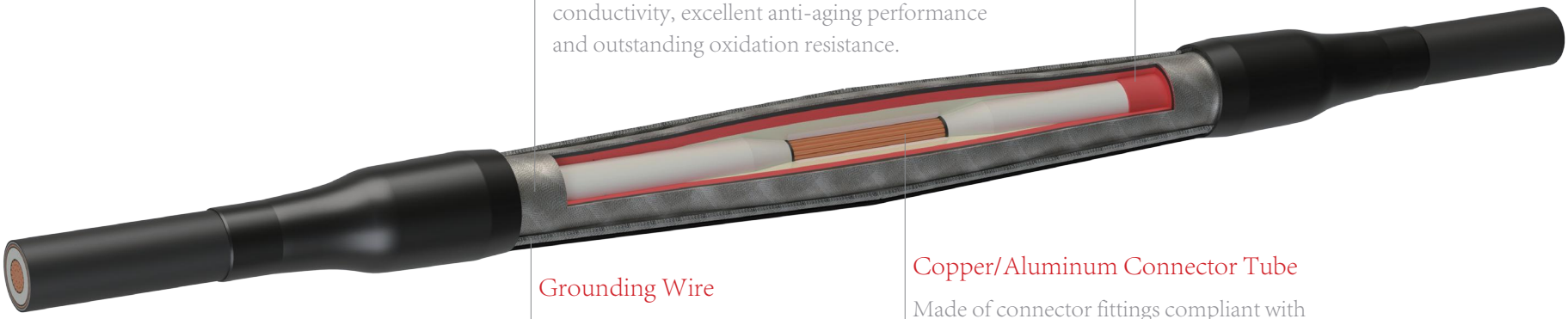
1-35kV Heat-Shrinkable Joint

Heat-Shrinkable Insulating Tube

Made of cross-linked polymer materials, it possesses high insulation resistance and excellent dielectric strength, along with insulation, sealing and moisture-proof properties, and high-temperature resistance.

Copper Mesh

Made of high-density oxygen-free copper wire, it features strong electrical conductivity, excellent anti-aging performance and outstanding oxidation resistance.



Grounding Wire

Tin-plated copper braided tape, woven from multiple strands of high-purity oxygen-free copper wire (or tin-plated copper wire), is flexible, reliable, and features strong corrosion resistance and oxidation resistance.

Copper/Aluminum Connector Tube

Made of connector fittings compliant with GB/T 14315, it exhibits excellent electrical conductivity, featuring high conductivity, high reliability, and strong corrosion resistance, enabling reliable connection of cable cores.

Brief Introduction

Product Model: JRS

Executive Standards: IEC 60502, GB/T 12706

Application Scope: The following are nominal cross-sections, which can be expanded according to the actual engineering conditions

Rated voltage	Applicable cable cross-section
26/35kV	25~1200mm^2
12/20kV,18/20（30）kV	25~800mm^2
8.7/10kV,8.7/15kV	16-630mm^2
0.6/1kV	16-630mm^2

10-35kV Prefabricated Cable Termination

Brief Introduction

Executive Standards:IEC 60502 GB/T 12706

Applicable Cross-Sectional Area: 50-400mm^2

Rated Voltage	Maximum Operating Voltage	Basic Impulse Insulation Level (BIL)
26/35kV	40.5kV	200kV
12/20kV	24kV	125kV
8.7/15kV	17.5kV	95kV

Technical Advantages and Features of the Product

It adopts a main insulation structure of silicone rubber, using imported silicone rubber, with the prefabricated stress cone formed by one-time injection molding.

It ensures the adaptation range of the insulation outer diameter of the cable core and guarantees the interface fastening force.

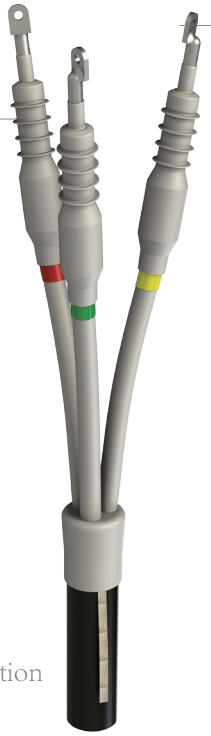
It maintains the stress control part free from deformation.

It features good grounding and no potential floating.

Compared with cold-shrink terminations, it requires no expansion and has a long product storage life.

Stress Cone

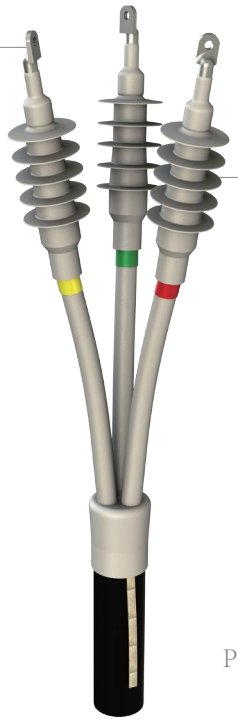
Adopting imported liquid silicone rubber for injection vulcanization molding, it features high insulation resistance, high breakdown voltage resistance, high temperature resistance, and other characteristics.



Prefabricated indoor cable termination (Model: NYZ)

Copper/Aluminum Terminals

Adopting the connecting fittings specified in GB/T 14315, it features excellent electrical conductivity, high conductivity, high reliability, and strong corrosion resistance, enabling reliable conductive connection between conductors and equipment.



Stress Cone

Made of imported liquid silicone rubber through injection vulcanization molding, it boasts strong pollution resistance, high creepage distance, excellent breakdown voltage resistance, high temperature resistance, and other characteristics.

Prefabricated outdoor cable termination (Model: WYZ)

10-35kV Prefabricated Joint

Armor Tape

It features high tensile strength, strong creep resistance, corrosion resistance, high temperature resistance, and other characteristics.

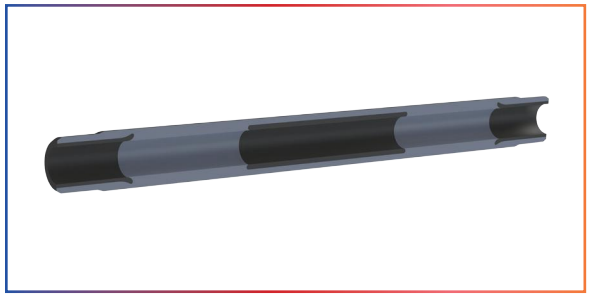
Stress Cone

Adopting imported liquid silicone rubber for injection vulcanization molding, it features high insulation resistance, high breakdown strength, high temperature resistance, and other characteristics.

Grounding Wire

Tinned copper braided tape, woven from multiple strands of high-purity oxygen-free copper wires (or tinned copper wires), is flexible, reliable, and features strong corrosion resistance and oxidation resistance.





Main Components

Copper/Aluminum Connecting Tube

Adopting the connecting fittings in line with GB/T 14315, it boasts excellent electrical conductivity, featuring high conductivity, high reliability, and strong corrosion resistance, thus enabling reliable connection of conductors.

10-35kV prefabricated joints (Model: JYZ)

10-20kV Inter-Cone Plug-In Termination

Brief Introduction

Product Model: GLCBN

Executive Standards: IEC 60502，EN50181，GB/T 12706

Applicable Environment:
Temperature range: -50℃ ~ +50℃

Application Scope:
This terminal product is widely applicable to the terminals of equipment such as electrical switches, transformers, ring main units, and cable connections.

Technical Advantages and Features of the Product

An internal stress cone structure is adopted.

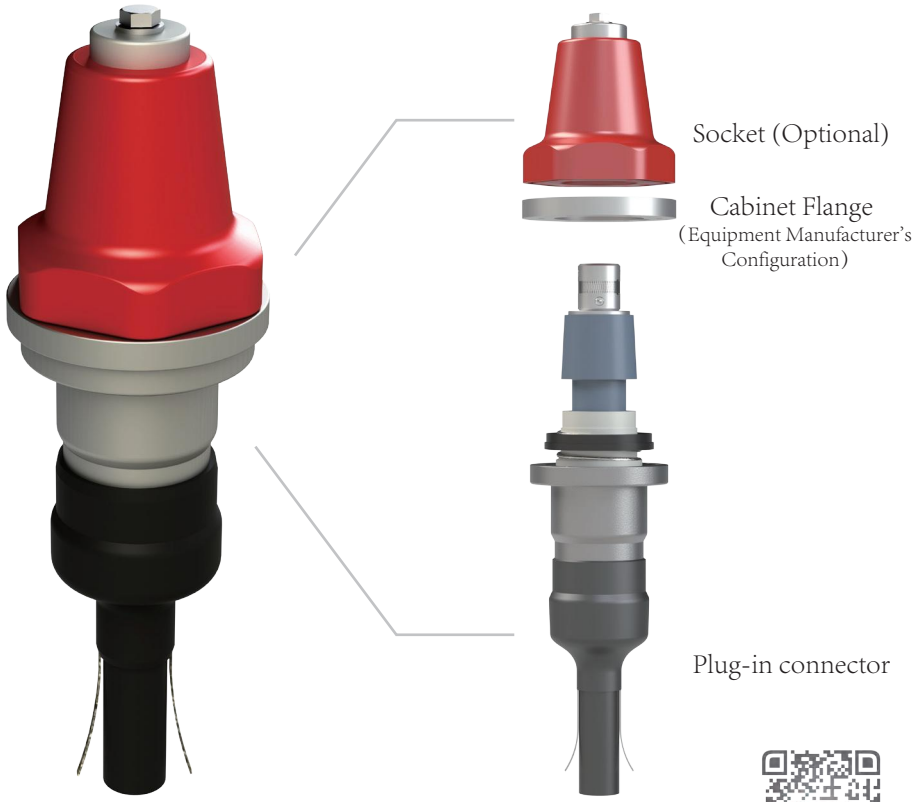
It ensures the adaptation range of the insulation outer diameter of the cable core and guarantees the interface clamping force.

It is equipped with an attractive metal shell.

Technical Specifications

System Rated Voltage U0/U	System Long-Term Maximum Operating Voltage Um	Rated Current
8.7kV/10kV;12/20kV	17.5kV;24kV	250A-630A

Impulse Withstand Voltage Level (BIL)	System Frequency	Line Design Service Life
95 kV;125kV	50Hz	＞30年



Scan the code to view detailed parameters

35kV Inter-Cone Plug-In Termination

Brief Introduction

Product Model: GLCBN

Executive Standards: IEC 60502, EN 50181, GB/T 12706

Applicable Ambient
Temperature: -50℃ ~ +50℃

Scope of Application:
This terminal product is widely suitable for terminal connections of equipment such as electrical switches, transformers, ring main units, as well as cable connections.

Technical Advantages and Features of the Product

Adopts a stress cone structure internally.

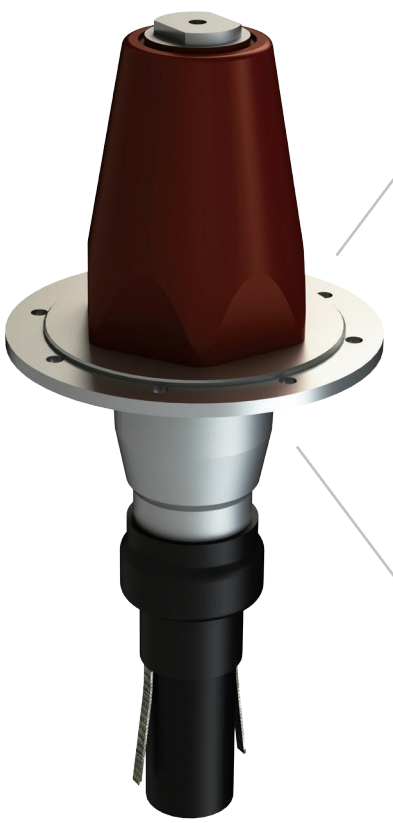
Ensures the adaptation range of the insulation outer diameter of the cable core and guarantees the interface clamping force.

Equipped with an aesthetically pleasing metal shell.

Technical Specifications

System Rated Voltage U0/U	System Long-Term Maximum Operating Voltage Um	Rated Current
26kV/35kV	40.5kV	800A-1250A

Impulse Withstand Voltage Level (BIL)	System Frequency	Line Design Service Life
200kV	50Hz	＞30年





Socket (Optional)

Cabinet Flange
(Equipment Manufacturer's Configuration)



Plug-in connector

Scan the code to view detailed parameters

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10 - 20kV Tunnel Quick Connector(With Aluminum Alloy Waterproof Housing)

Technical Specifications

System Rated Voltage U0/U	Maximum Operating Voltage	Rated Current
12/20kV	24kV	250-630A
8.7/15kV	17.5kV	250-630A

System Frequency	Impulse Withstand Voltage Level (BIL)	Line Design Service Life
50Hz	125kV	＞30
50Hz	95kV	＞30

Brief Introduction

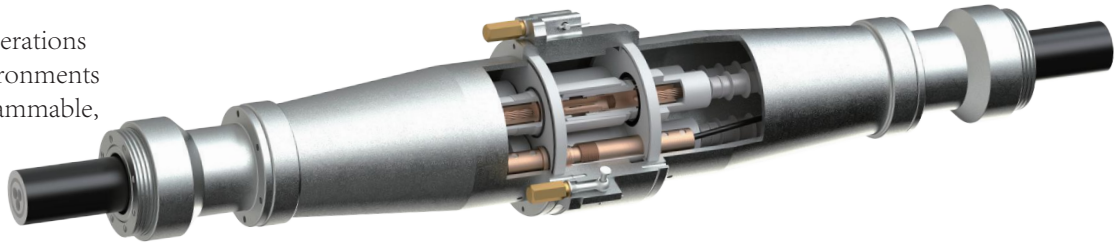
Product Model: JCKL

Executive Standards: IEC 60502, GB/T 12706

Applicable Environment:
Temperature range of -50℃ ~ +50℃

Scope of Application:
Widely suitable for operations in harsh outdoor environments and high-pollution, flammable, and explosive places;

used for cable connection in shield machine construction such as subway tunnels, water channel tunnels, and civil air defense tunnels



Technical Advantages and Features of the Product

The conductor adopts a plug-in structure, enabling convenient installation.

Cold-shrinkable silicone rubber insulation is used for insulation connection, ensuring reliable electrical performance.

An aluminum alloy shell is adopted, giving the product strong impact resistance.

The product features water resistance, fire resistance, corrosion resistance, cold resistance, high-temperature resistance and aging resistance.



20kV Rapid Casting Plug



20kV Rapid Casting Socket

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Scan the code to view detailed parameters

10 - 20kV Tunnel Quick Connector(With Fiberglass Waterproof Housing)

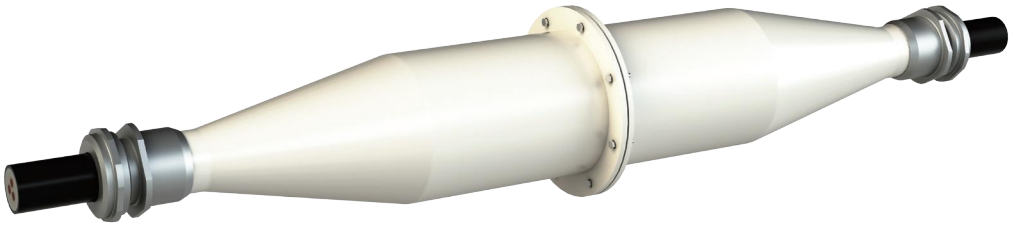
Brief Introduction

Product Model: JTD

Executive Standard: IEC 60502; GB/T 12706

Applicable Environment:
Temperature range of -50℃ ~ +50℃

Scope of Application:
This terminal product is widely applicable to the terminals of equipment such as electrical switches, transformers, ring main units, as well as cable connections.



Technical Specifications

System Rated Voltage U0/U	Maximum Operating Voltage	Rated Current
12/20kV	24kV	250-630A
8.7/15kV	17.5kV	250-630A

System Frequency	Impulse Withstand Voltage Level (BIL)	Line Design Service Life
50Hz	125kV	＞30
50Hz	95kV	＞30

Technical Advantages and Features of the Product

Adopts a stress cone structure internally.

Ensures the adaptation range of the insulation outer diameter of the cable core.

Guarantees the interface clamping force; prevents deformation of the stress control part during installation.

Equipped with a grounding protection screen for reliable grounding.

FRP (Fiberglass Reinforced Plastic) shell with a sealed and waterproof structure.

Light in weight and low in cost.

Scan the code to view detailed parameters

10kV-110kV Test Cable

Brief Introduction

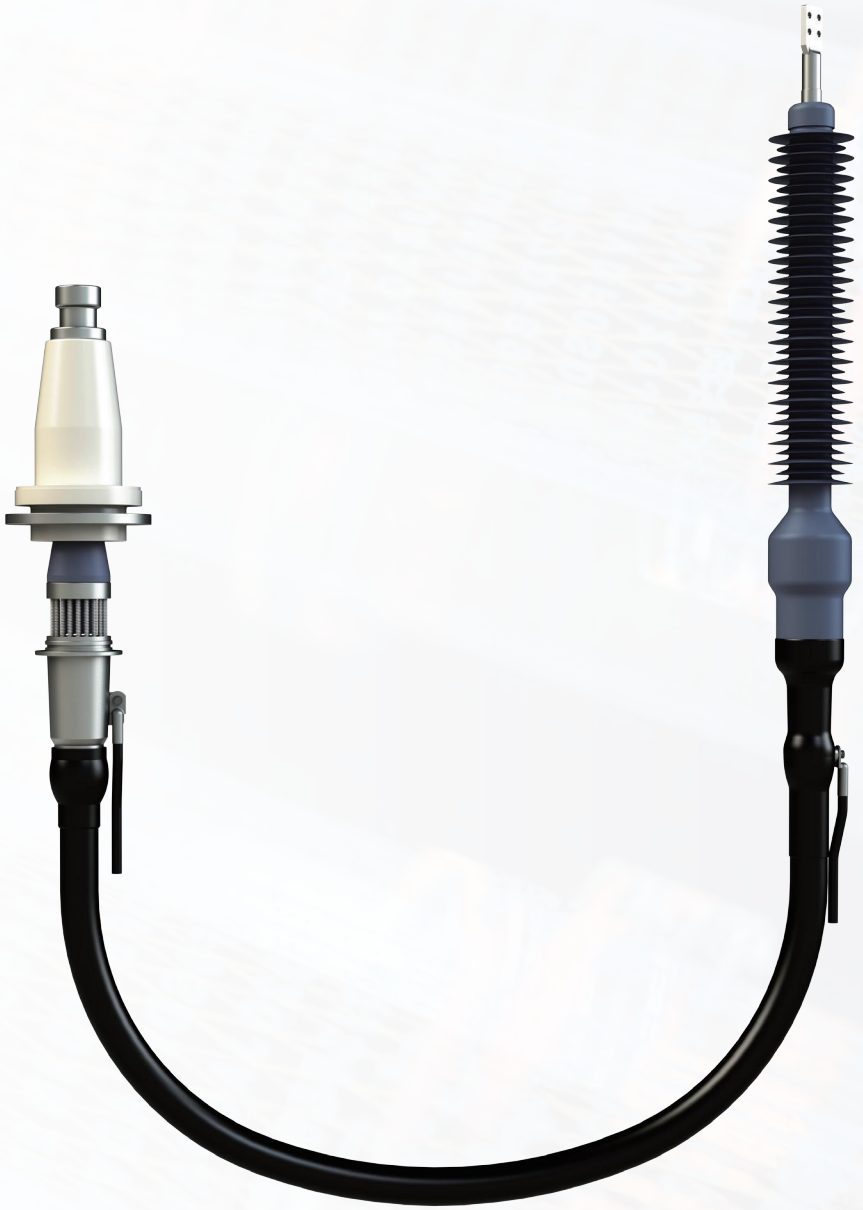
This product features a structural design where one end is equipped with a stainless steel epoxy cylinder or a GIS terminal, and the other end with an outdoor dry-flash terminal, both mounted on cross-linked cables. It is mainly used for withstand voltage tests of transformers and GIS combined electrical equipment, and can also be applied to other preventive tests in electrical systems.

Product Model: GLSYD

Implemented Standards: GB/T 12706, GB/T 11017

Application Scope:
Suitable for power lines with a voltage level of 10kV-110kV

Product Features:
Flexible application and reusability
Convenient for testing
Easy installation
Excellent insulation performance



10kV-110kV Gas Joint For Test

Brief Introduction

The cable test cylinder adopts an inflatable structure with a stainless steel shell and an epoxy cone bushing. It is used for testing cable plug-in terminals. The test chamber simulates the compartment test silo of GIS (Gas Insulated Switchgear) combined electrical equipment, enabling factory inspection of cable operation products and meeting the inspection and testing requirements for cables and electrical accessories after installation and construction.



Implemented Standards:
For 10kV-35kV: EN 50381
For 66kV-110kV: GB/T 22381, IEC 62271, IEC 60859

Application Scope:
Suitable for power lines with a voltage level of 10kV-110kV

Product Features:
Reasonable design of the test device
Wide application range
Simple structure
Easy to use
Flexible application
Safe and reliable

Product Model	1# Test Silo	2# Test Silo	3# Test Silo	4# Test Silo	5# Test Silo
Applicable Cable Voltage	10-20kV	20-35kV	35kV	66kV	110kV

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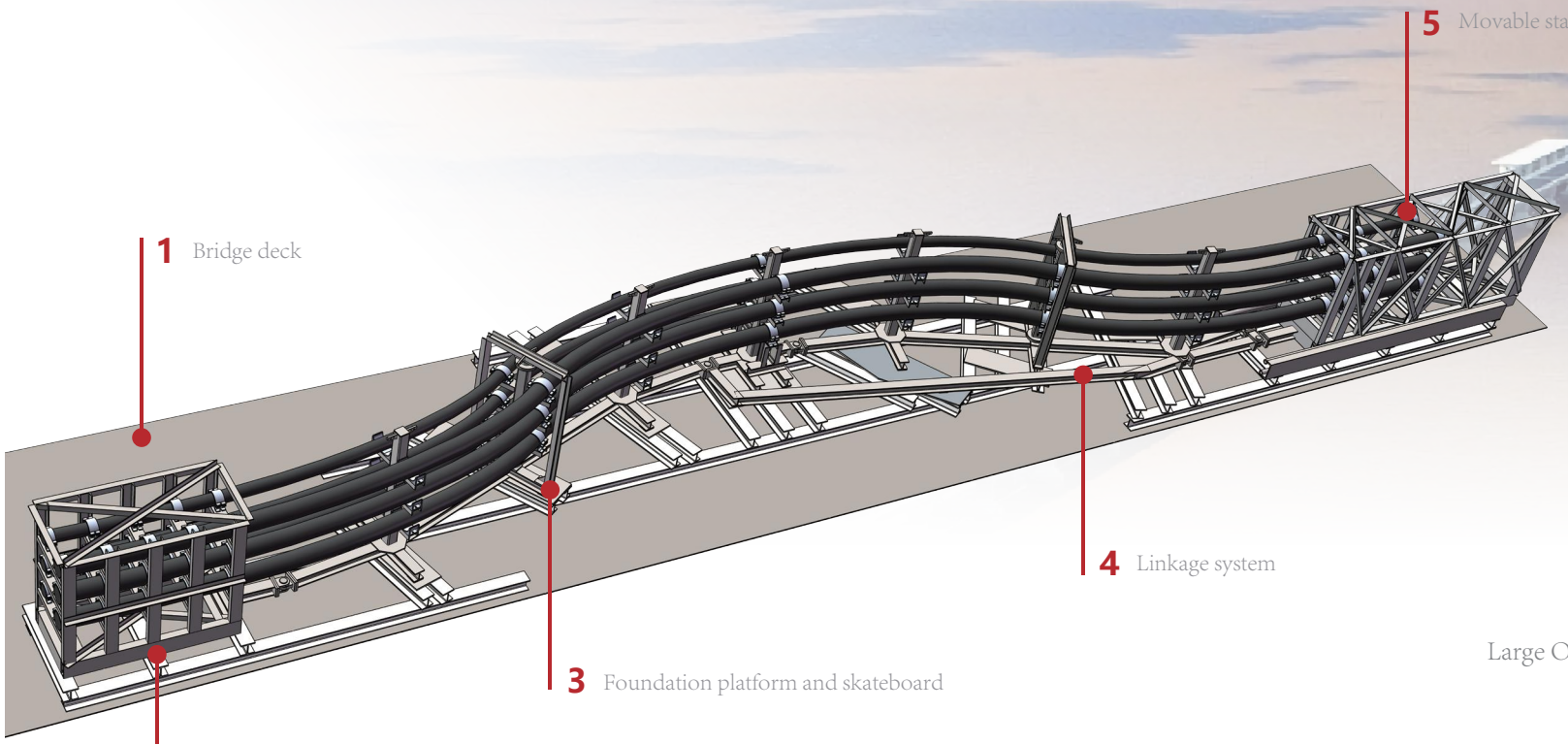
02 OFFSET PRODUCTS

PART 02

THE DESIGN OF LARGE AND SMALL OFFSET ADDRESSES THE REQUIREMENTS OF DIFFERENT BRIDGES FOR EXPANSION AND CONTRACTION AMOUNTS

OFFSET Bridge Laying Cable Expansion Compensation Device



Large OFFSET unit

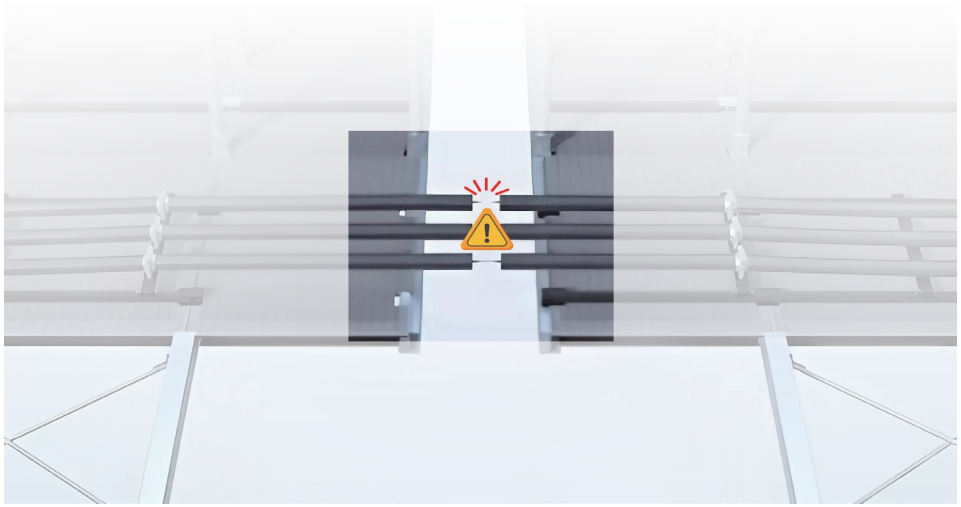
The OFFSET arranges an arc by reserving a certain length of cable in advance, under the conditions of meeting the cable's bending radius and bending fatigue strength. When the cable is stretched or contracted driven by the bridge structure, the cable can still meet the requirements for bending radius and fatigue strength after undergoing arc-shaped transformation along the specified path. Even after repeated bending, the cable's metal sheath will not crack or be damaged. An oil-free bearing movement mechanism (capable of rotating and moving diagonally along the sliding groove) is used at the apex of the OFFSET, which utilizes smooth arc motion to absorb the cable's expansion and contraction.

Brief Introduction

With the emergence of cross-sea and cross-river bridge projects, power transmission projects involving the laying of high-voltage cables along bridges have emerged accordingly. For the cable laying itself, utilizing the existing weight-reduction spaces of the bridge to lay cables significantly reduces the total cost of the power transmission project.

For high-voltage cables laid on bridges, it is necessary to adopt a bridge cable laying expansion and contraction compensation device (hereinafter referred to as OFFSET) to eliminate or reduce the adverse impact of bridge expansion and contraction on the cables.

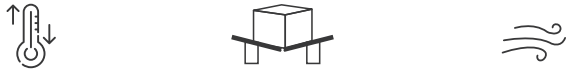
In the case of cross-sea bridges, the expansion and contraction amount generated at the deck ends of most long-span cable-stayed bridges and suspension bridges in main navigation channels will exceed 1 meter. Only by using the cable OFFSET device can this engineering problem be well solved.



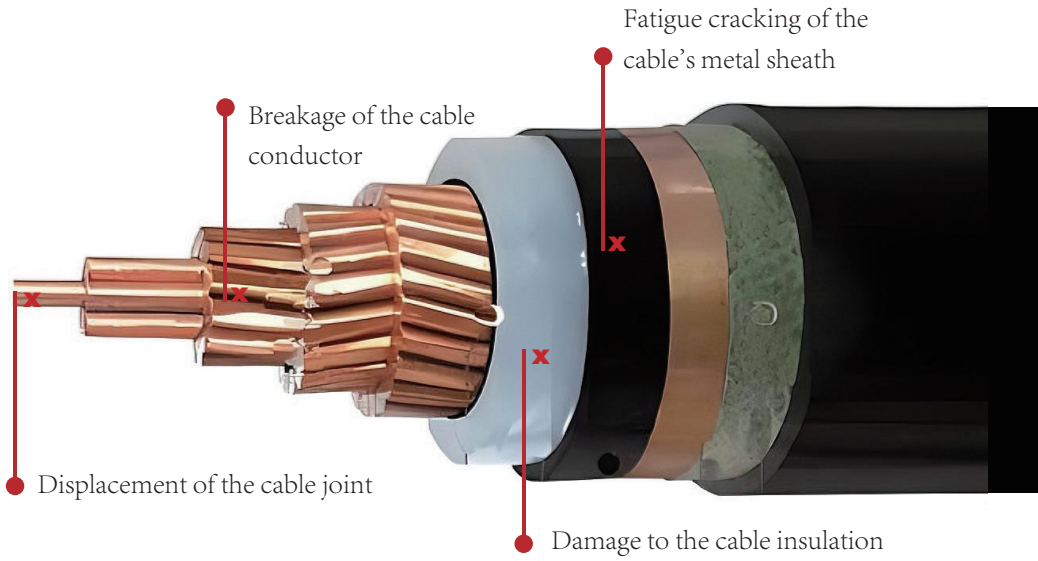
The power cables laid on a certain bridge in Guangzhou (without the adoption of the bridge cable laying expansion and contraction compensation device)

It was put into operation in the 1990s. In 2010, the metal sheath and outer sheath of the cable near the bridge expansion joints broke, resulting in cable breakdown.

The biggest technical challenge in the cable laying project along the bridge lies in the need to effectively address the gap changes at the bridge deck joints caused by variations in factors such as temperature, load, and wind force.



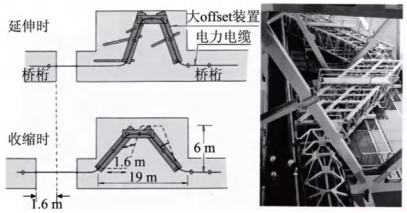
These gap changes will cause the cables laid between the two bridge ends to frequently stretch and compress. Such expansion and contraction will lead to the cables bulging or being subjected to excessive tension. Due to the uncontrolled and repeated bending deformation of the cables, phenomena such as fatigue cracking of the cable's metal sheath, breakage of the cable conductor, damage to the cable insulation, and displacement of the cable joint will occur.



The main forms of OFFSET

The OFFSET technology originally originated in Japan and has achieved extensive development through years of application research. Up to now, a large number of power cable bridge laying projects around the world have adopted OFFSET devices to address the issue of bridge expansion and contraction. Currently, there are mainly two types of OFFSET used internationally:

In 1986, Japan used an OFFSET device at the expansion joint of the 187kV high-voltage power cable laying project on the Ohnaruto Bridge — the world's first long-span suspension bridge with an expansion joint of 1600mm — and the device has been operating safely to this day.



Laying of 187kV Power Cables on Japan's Ohnaruto Bridge

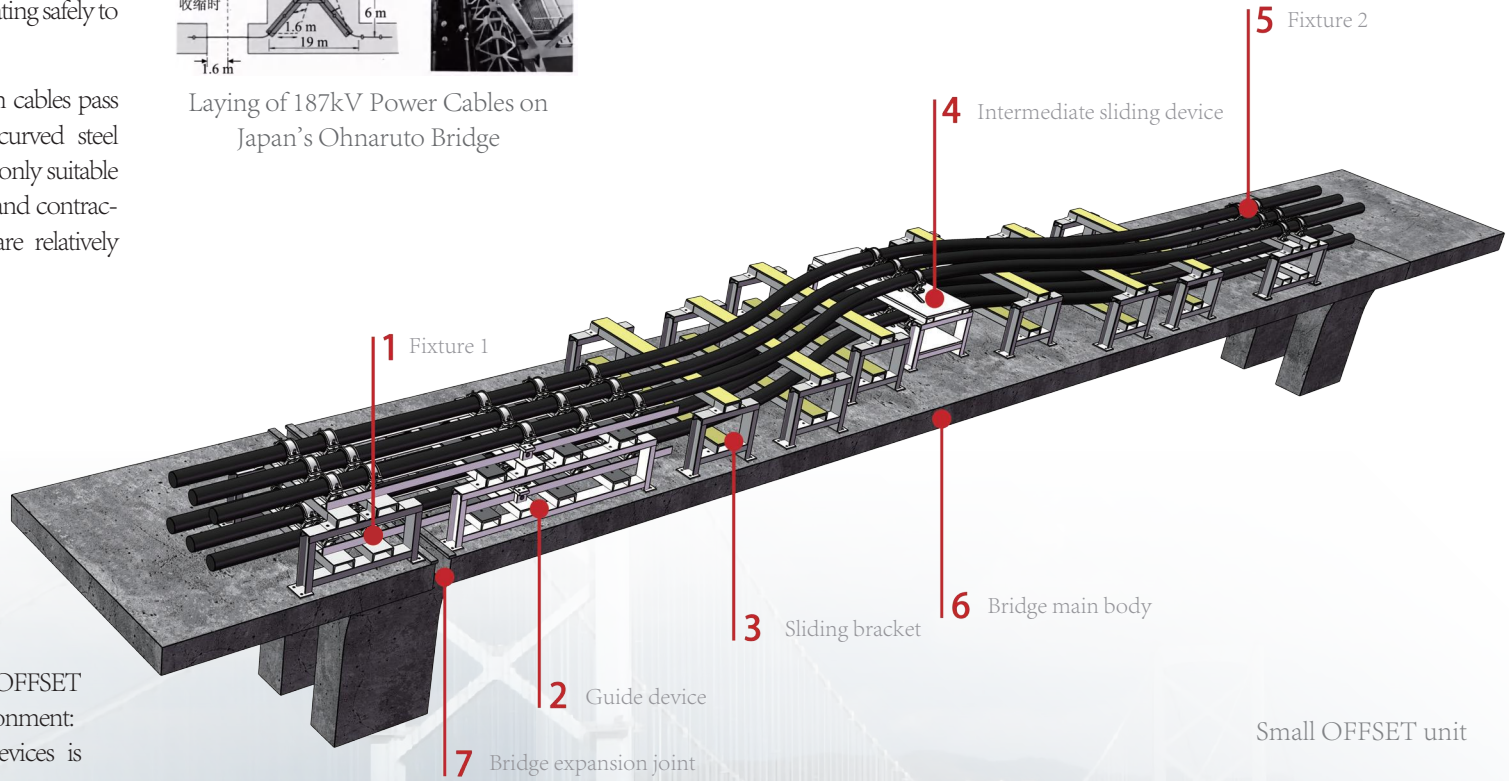
Countries such as those in Europe: When cables pass through expansion joints, pre-installed curved steel plates are used for fixation. This method is only suitable for scenarios where the bridge expansion and contraction range is small and the cable lines are relatively non-critical.



Laying of 132kV Power Cables on the River Lea Bridge in the UK

It can be seen that there are various types of OFFSET devices depending on the installation environment: The structure of European OFFSET devices is relatively simple, and their expansion and contraction methods are relatively random.
Japanese OFFSET devices can be customized into different configurations for bridges in different environments, featuring precise compensation and high reliability.

Due to differences in bridge type, length, and load, there is a significant variation in the expansion and contraction range at the bridge expansion joints. The design of large and small OFFSET devices addresses the requirements for different expansion and contraction ranges of various bridges. Generally, bridges with an expansion and contraction range of less than 400mm are equipped with small OFFSET devices, while those with a range greater than 400mm are equipped with large OFFSET devices.



Small OFFSET unit

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110kV Wanhong Line Yinlong Bridge Project



In the construction project of the Shanghai Donghai Bridge in 2005, the OFFSET technology was adopted for the 110kV power transmission cables (supplying power to Yangshan Deep-Water Port), marking its first application in China. Later, in the construction of the Shanghai Yangtze River Bridge, the OFFSET technology was also used for the 220kV power transmission cables (Chongming Interconnection Project). After nearly a decade of continuous operation, these cables have maintained safe and reliable performance with excellent results. Our company's technical and engineering teams have further participated in the R&D and construction of key domestic OFFSET projects on multiple occasions, accumulating rich experience in design, production, installation, and operation.

In the 2020 Yinlong Bridge project in Dongguan, Guangdong, the bridge featured a complex structure, narrow cable channels, and high difficulties in OFFSET design and construction. Despite these challenges, the OFFSET technology, products, and services provided by Shenyang Guolian won unanimous praise from the client. This achievement was reported by media outlets such as People's Daily.



Long life

The structure and materials meet the requirements for more than 30 years of use



Quality Assurance

It has been tested by an authoritative organization and insured for the product at an insurance institution



Intelligent monitoring

Can be equipped with intelligent modules to monitor the status of cables and OFFSET devices online

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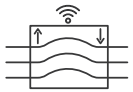
By equipping with the OFFSET intelligent module, operation and maintenance units can be helped to clearly and comprehensively grasp the operating status of OFFSET.



Real-time acquisition of cable expansion compensation displacement



Real-time capture of video around the cable expansion compensation devicedisplacement



Real-time acquisition of cable surface and ambient temperature



Statistical analysis of frequency and displacement of cable expansion

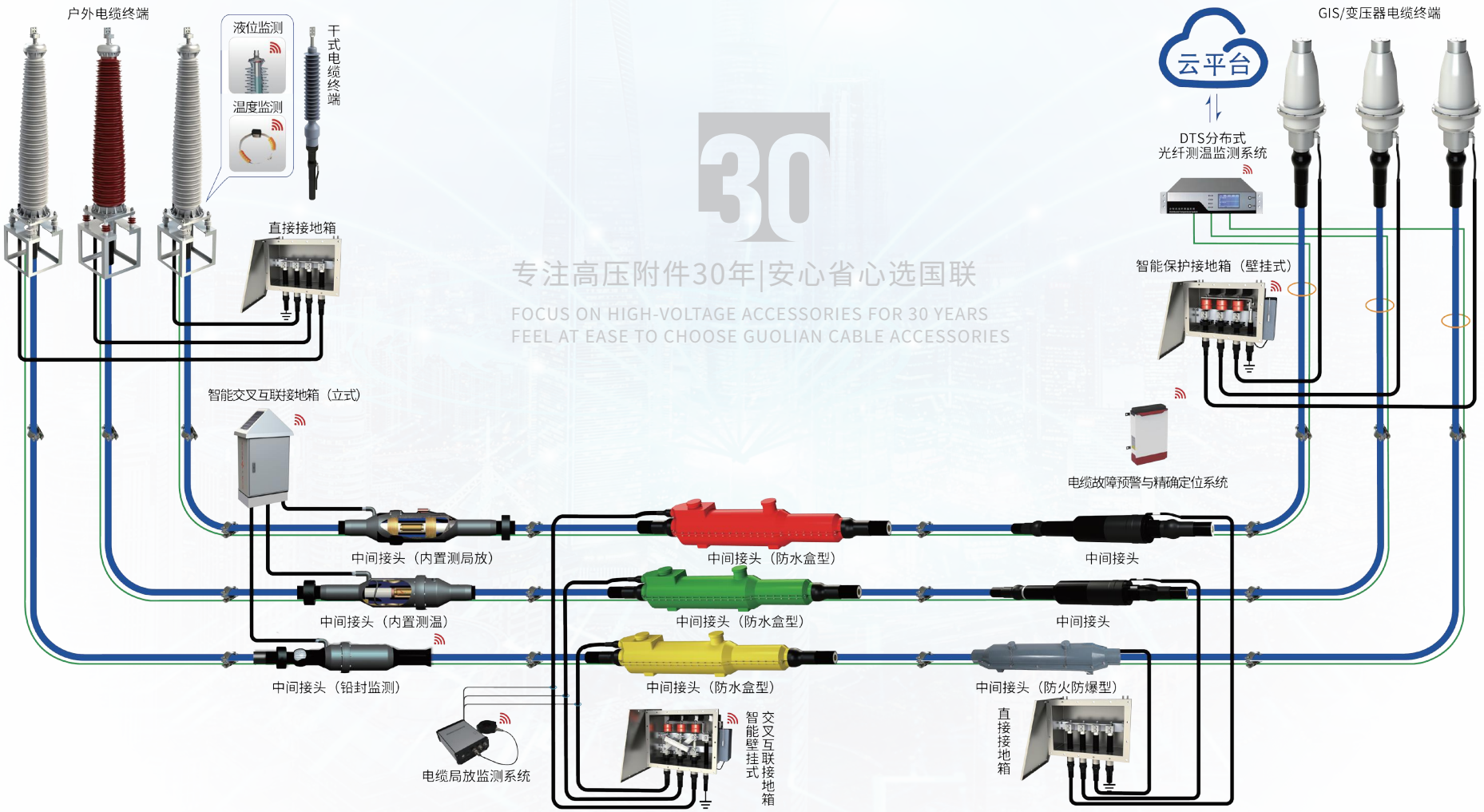
03

INTELLIGENT PRODUCTS

PART 03

REALIZE FAULT EARLY WARNING FOR HIGH-VOLTAGE CABLES AND CABLE ACCESSORIES TO ENSURE THE RELIABILITY OF THE CABLE SYSTEM THROUGHOUT ITS ENTIRE LIFE CYCLE

INTEGRATED INTELLIGENT ONLINE MONITORING SOLUTION FOR HV CABLES AND ACCESSORIES



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Intelligent Link Box

Brief Introduction

The intelligent grounding box has all the functions of a traditional grounding box. On this basis, by installing different types of high-sensitivity sensors, high-definition cameras, and other components (either externally or internally) on the cable, cable termination, cable joint, and the main body of the grounding box, and combining advanced information transmission technologies such as optical fiber and wireless communication, the collected data is calculated and processed before being remotely transmitted to the server platform. Users can log in with a designated account and password to view all operating data in real time on computers or mobile devices. This realizes real-time monitoring of the operating status of cable lines and provides a guarantee for the safe operation of cable lines.

Technical Advantages and Features of the Product

It can monitor the operating status of cables.

It can monitor the environment around cable lines.

It supports flexible networking and multiple transmission modes, as well as a redundant power supply mode to ensure no data loss under extreme conditions.

When data anomalies occur, it sends SMS notifications promptly to enable unattended operation. It reserves multiple interfaces and can be integrated with other intelligent devices.

In case of unauthorized opening, it can trigger audio-visual alarms and take photos for evidence collection.

A local server can be built according to the project requirements. It features strong compatibility, and monitoring data can be connected to third-party monitoring platforms in a user-specified manner.

Vertical Link Box

Vertical Intelligent Direct Link Box
(Model LZSLB)

Vertical Intelligent Protective Link Box
(Model LZPLB)

Vertical Intelligent Cross connection Link Box
(Model LZCLB)

Scan the code to
view detailed parameters



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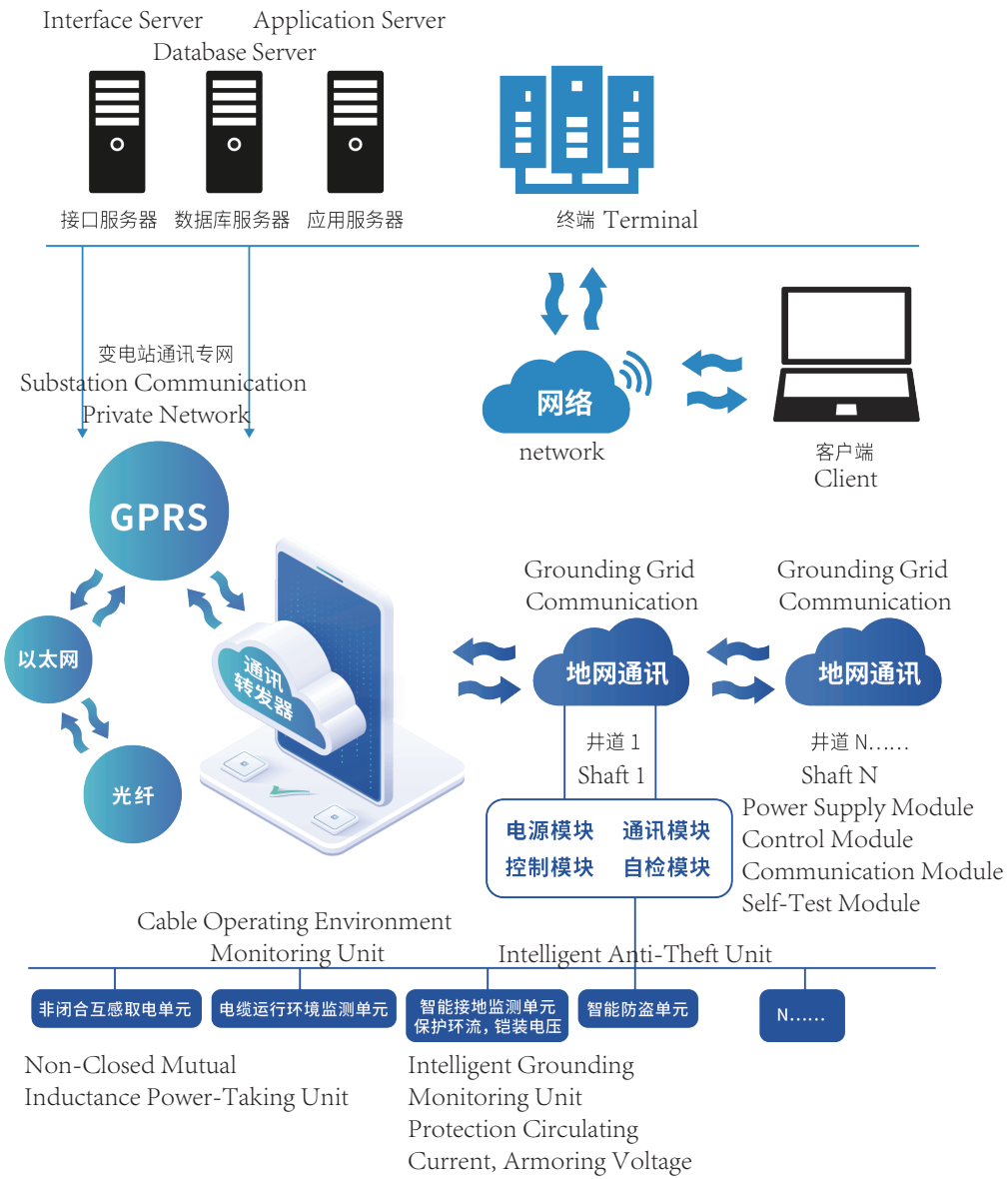
System topology diagram



Technical Parameters

Parameter \ Name		Vertical Intelligent Direct Grounding Box	Vertical Intelligent Protective Grounding Box	Vertical Intelligent Cross Connected Grounding Box
DC Withstand Voltage Test		25kV, 1 minute, no flashover, no breakdown		
Impulse Voltage Test		Peak Value: 47.5kV, 10 Times for Both Positive and Negative Polarities, No Flashover, No Breakdown		
Waterproof Performance		IP68		
Measurement Accuracy Class		0.5		
Data Transmission Method		Wireless 4G Communication / Optical Fiber Transmission		
Standard Power Supply Acquisition Mode		Solar Energy/CT Power Taking/Backup Battery		
Function	Standard	①Sheath Circulating Current Monitoring ②Grounding Wire Anti-Theft	① Sheath Voltage Monitoring ② Grounding Wire Anti-Theft	① Sheath Circulating Current Monitoring / Sheath Voltage Monitoring ② Grounding Wire Anti-Theft
	Optional	① Cable Surface Temperature Monitoring ② Ambient Temperature and Humidity Monitoring ③ Joint Vibration Alarm ④ Smoke Alarm ⑤ Tilt Alarm ⑥ Operating Current Monitoring ⑦ Sump Water Level Monitoring ⑧ Image Monitoring ⑨ Anti-Theft Lock		



Wall-mounted intelligent direct link box
(Model ZSLB)

Wall-mounted intelligent protective link box
(Model ZPLB)

Wall-mounted intelligent cross-connection link box
(Model ZCLB)

Note: The power acquisition method and transmission method of the monitoring device can be flexibly changed according to the actual operating conditions.

Name / Parameter		Wall-mounted intelligent grounding link box	Wall-mounted Intelligent Protective Grounding box	Wall-mounted Intelligent Cross connection link box
DC Withstand Voltage Test		25kV, 1 minute, no flashover, no breakdown		
Impulse Voltage Test		Peak Value: 47.5kV, 10 Times for Both Positive and Negative Polarities, No Flashover, No Breakdown		
Waterproof Performance		IP68		
Measurement Accuracy Class		0.5		
Data Transmission Method		Wireless 4G Communication / Optical Fiber Transmission		
Standard Power Supply Acquisition Mode		AC220V		
Function	Standard	①Sheath Circulating Current Monitoring ②Grounding Wire Anti-Theft	① Sheath Voltage Monitoring ② Grounding Wire Anti-Theft	① Sheath Circulating Current Monitoring / Sheath Voltage Monitoring ② Grounding Wire Anti-Theft
	Optional	① Cable Surface Temperature Monitoring ② Ambient Temperature and Humidity Monitoring ③ Joint Vibration Alarm ④ Smoke Alarm ⑤ Tilt Alarm ⑥ Operating Current Monitoring ⑦ Sump Water Level Monitoring ⑧ CT Power-Taking Ring ⑨ Photovoltaic (Solar Energy) Power Taking		

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Built-In Cable Partial Discharge Monitoring

Brief Introduction

The Built-in Cable Partial Discharge Online Monitoring System is mainly used to monitor partial discharge signals occurring in high-voltage cables and the connected high-voltage equipment. As an independent and distributed partial discharge detection system, it adopts a flexible networking method for data transmission to realize real-time online monitoring of partial discharges in cable systems. Through the built-in cable partial discharge analysis system, it evaluates the insulation status of the system, predicts the development trend of such partial discharges, prevents sudden electrical accidents, and provides effective data support for the condition-based maintenance and repair of equipment.

Working Principle

The built-in cable partial discharge (PD) monitoring technology embeds PD sensors inside cable joints and induces PD signals through capacitive coupling. This addresses practical issues such as strong interference signals in PD sensors and inaccurate fault location, while improving the accuracy and stability of PD monitoring equipment. The system mainly consists of five parts: the cable partial discharge detection host, monitoring center, discharge monitoring device, partial discharge control module, and partial discharge acquisition module.

Function Introduction

The built-in cable partial discharge (PD) monitoring technology enables the integration of PD sensors inside cable joints. This allows for accurate real-time monitoring of cable partial discharges and precise localization of PD sources, addressing current challenges in PD monitoring such as strong interference signals, inaccurate PD detection, and imprecise fault location. Additionally, the technology establishes a PD expert analysis database: after data analysis, PD results are presented directly—users do not need to analyze the data themselves and can view the results clearly. This significantly simplifies the workload of cable management departments and provides data support for their safety management efforts.

Technical Parameter

Project	Technical Parameter
Partial Discharge (PD) Measurement Range	5pC - 5000pC
Frequency Range	80kHz-20MHZ
Enclosure Protection Class	IP68
Operating Temperature	-40℃~+85℃
Operating Ambient Humidity	10% RH-98% RH
Atmospheric Pressure	86 kPa-106 kPa
Overall Power Consumption	⩽ 1W when data is not uploaded ⩽ 3W when data is being uploaded

System Composition

1-Built-in Capacitive Partial Discharge (PD) Sensor

2-Built-in Inductive Partial Discharge (PD) Sensor

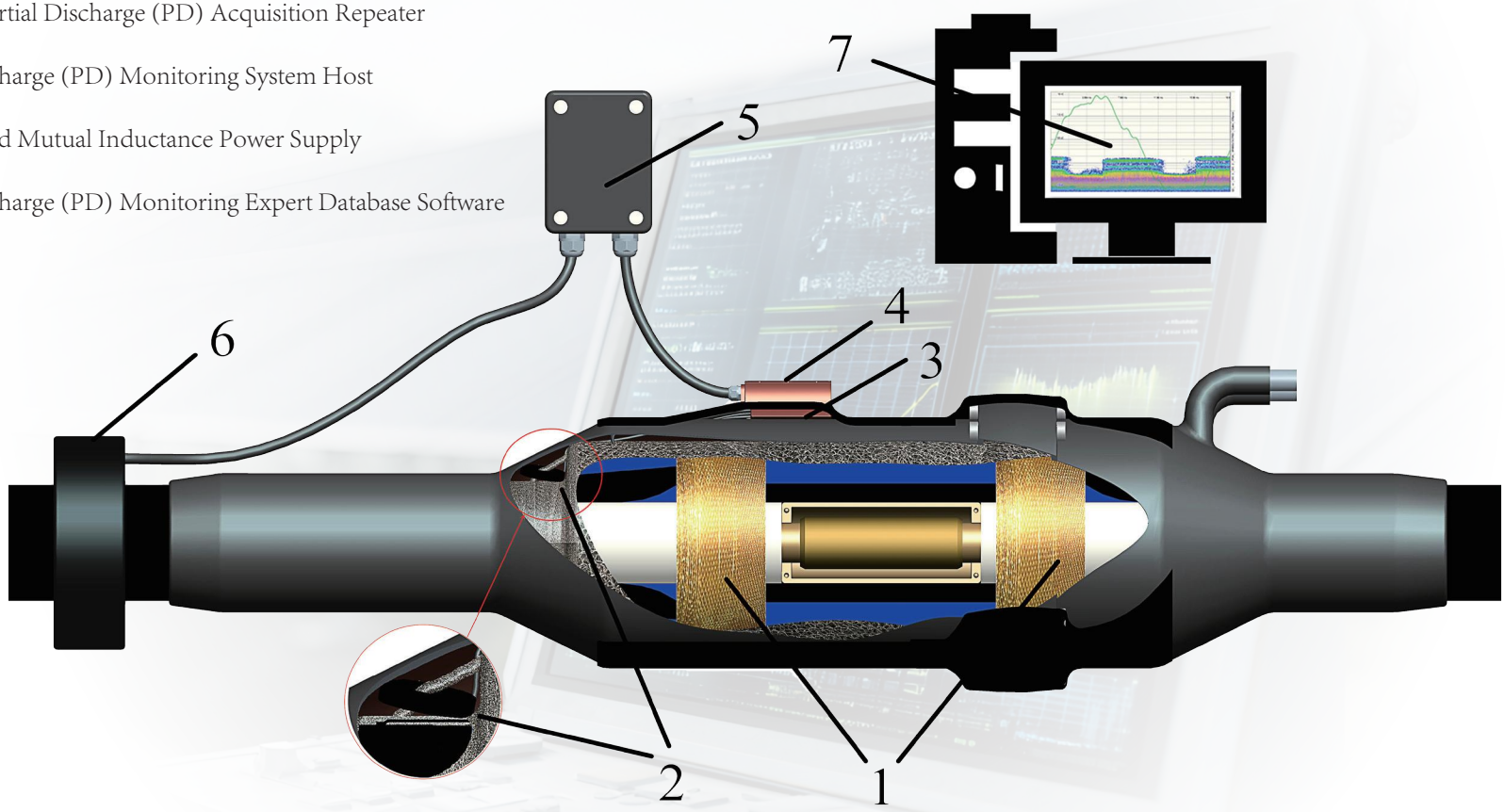
3-Built-in Partial Discharge (PD) Acquisition Module

4-External Partial Discharge (PD) Acquisition Repeater

5-Partial Discharge (PD) Monitoring System Host

6-Non-Closed Mutual Inductance Power Supply

7-Partial Discharge (PD) Monitoring Expert Database Software



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External Cable Partial Discharge Monitoring

Brief Introduction

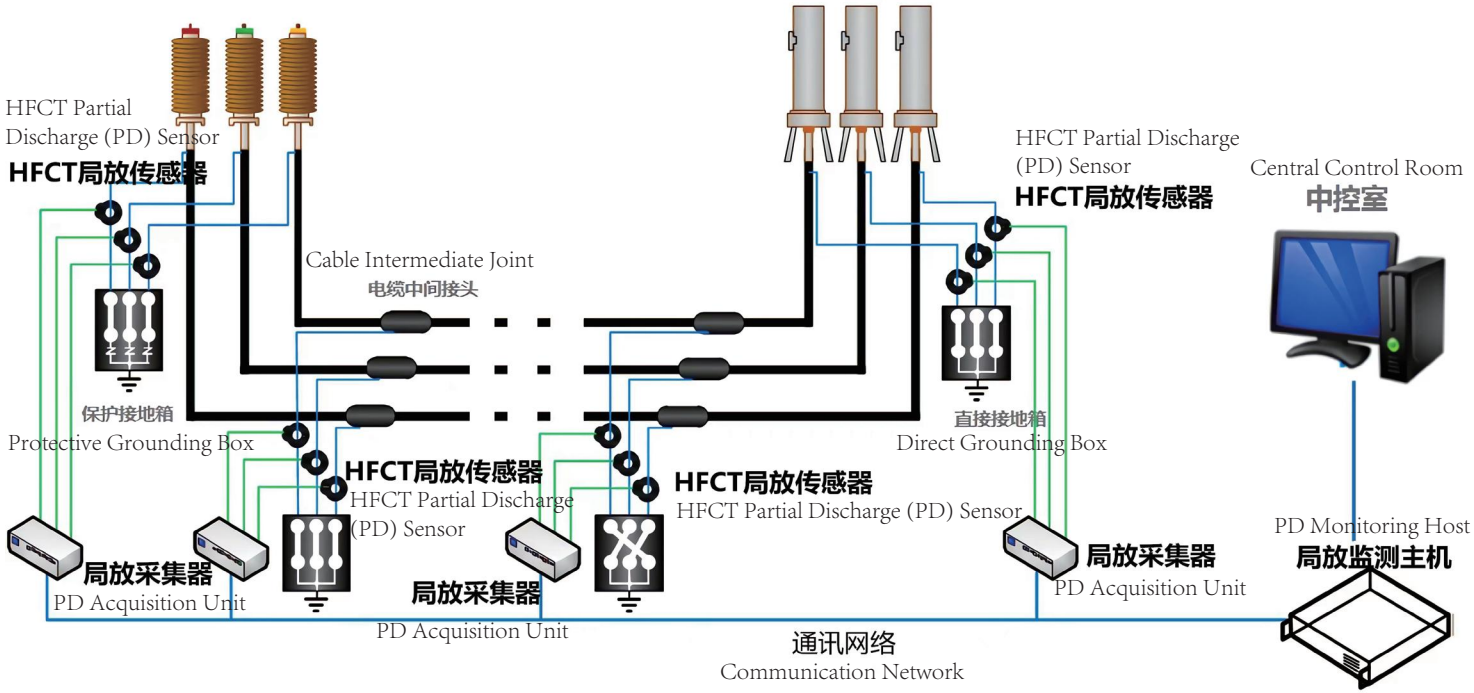
The external cable partial discharge (PD) monitoring system adopts a modular design. High-frequency current sensors installed on the grounding wires of cable joints capture the partial discharge pulse current signals from the cable body and joint areas. These signals are transmitted to the data collector via coaxial cables; after the analog signals undergo amplification, filtering, and analog-to-digital conversion, they are compared and analyzed against the database, then transmitted to the remote backend via optical fibers. The discharge information data obtained through these calculations is written into the database and simultaneously displayed on the software panel of the monitoring system.

Technical Parameters

Project	Technical Parameter
Partial Discharge (PD) Measurement Range	5pC - 5000pC
Sampling Frequency	⩾100 MS/s
Working Voltage	DC12V
Operating Temperature	-40℃~+85℃
Operating Ambient Humidity	10% RH-98% RH
Atmospheric Pressure	86 kPa-106 kPa
Enclosure Protection Class	IP68
Overall Power Consumption	⩽ 1W when data is not uploaded ⩽ 3W when data is being uploaded

Working Principle

The external cable partial discharge (PD) monitoring system mainly consists of high-frequency PD sensors, a PD monitoring system host, and a PD monitoring & analysis software platform. By installing partial discharge detection equipment on the grounding wires of cable joints, it conducts real-time online monitoring of PD signals in high-voltage cables and effectively eliminates interference signals. The PD signals are transmitted to the substation monitoring center via optical fibers; through the analysis system, the type and level of partial discharges are analyzed and judged, the impact of partial discharges is evaluated, the insulation status of equipment is determined, and the degree of cable insulation degradation is timely grasped—thus realizing early warning of cable insulation faults.



Cable Termination Wireless Temperature Measurement

Brief Introduction

The wireless temperature measurement system for cable terminations adopts passive wireless temperature sensing technology. Featuring excellent insulation and resistance to electromagnetic interference, it is currently the optimal solution for measuring the operating temperature of high-voltage cable terminations. It can effectively provide early warnings against accidents such as overheating and even burnout caused by aging, contact oxidation, overload, and other factors.

Product Features

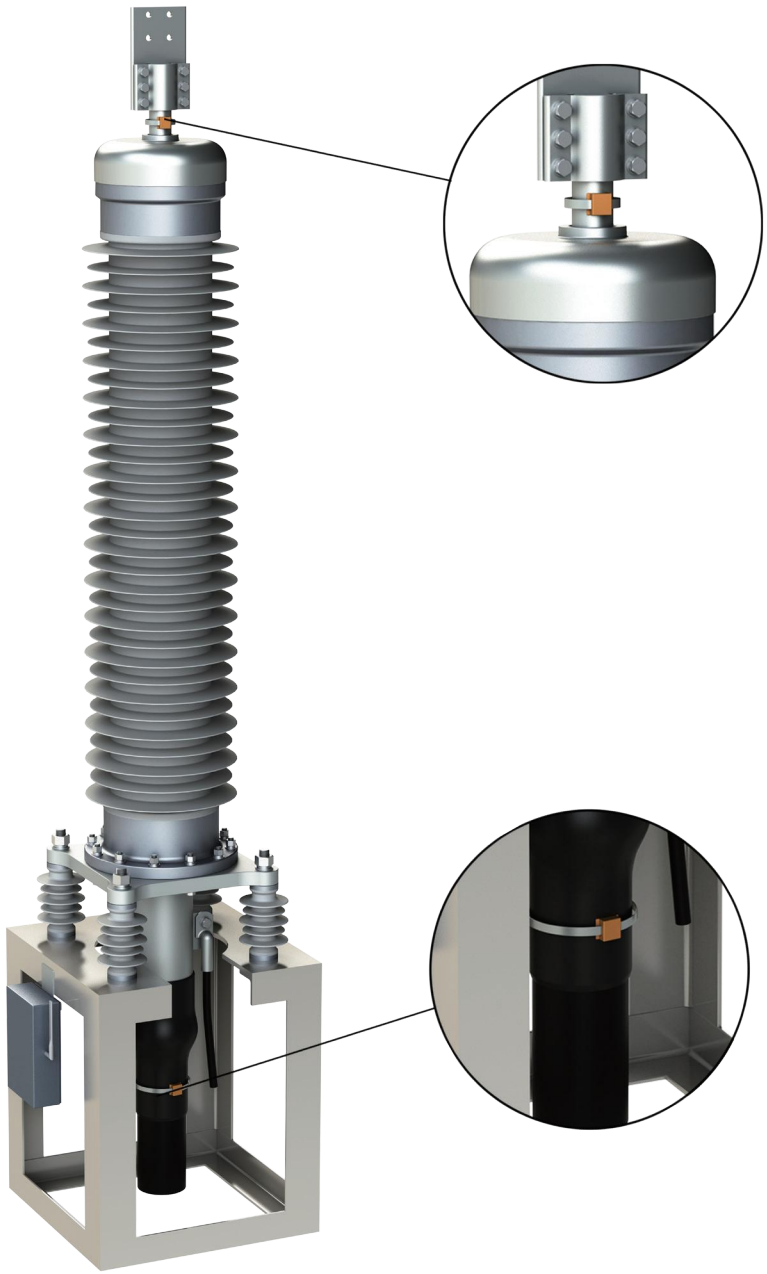
The monitoring module adopts an ultra-low power consumption design, featuring a wide operating range and no blind spots.

Fast response speed and timely alarm.

Stable and reliable performance, meeting maintenance-free requirements.

Automatic locking and recovery.

Unique dual-mode design, enabling convenient installation and maintenance.



System Composition

Temperature Measurement Module:
The temperature measurement module is responsible for collecting temperature data from temperature-sensitive points. Its operating power is obtained from the measured cable via an inductive coupling method.

Communication Host:
The communication host is responsible for collecting temperature data from all temperature measurement modules within its jurisdiction. It then forwards the temperature data to the central software or mobile terminals through a communication link. The forwarded data includes both temperature data and the host's own device status data.

Access Gateway:
The access gateway is responsible for accessing data from all communication hosts and transmitting command data from the central system to the respective hosts.

Central Software:
The central software is responsible for data display, system management, and maintenance. Its functions include real-time data display, statistical query, data download, and system management.

Mobile Terminal:
The mobile terminal is mainly used for temperature monitoring during on-site inspections and provides indexes of temperature monitoring points to support inspection work.

Function Introduction

Real-Time 24/7 Temperature Monitoring:
According to the cable operation management requirements, the extraction interval of temperature monitoring data can be set, with a minimum interval of 10 seconds.

Temperature Over-Limit Early Warning:
The temperature over-limit threshold is set in accordance with the requirements for the operating temperature of cable terminations, equipment clamps, and conductor connection parts specified in Code for Operation and Maintenance Management of Power Cables and Corridors (Q/GDW1512). An alarm will be triggered when the temperature exceeds this threshold.

Abnormal Temperature Change Early Warning:
A limit for temperature variation within a unit time is set. An alarm for abnormal temperature rise will be activated when the temperature rise rate exceeds this limit.

Relative Temperature Difference Over-Limit Early Warning:
When reference temperature measurement points are set, a relative temperature difference limit can be configured. An alarm for excessive relative temperature difference will be triggered if the temperature difference between two measurement points exceeds this limit.

Data Hidden Hazard Analysis:
Based on historical temperature data and current-carrying data, hidden hazard analysis and maintenance guidance for cable terminals are provided.

Built-In Conductor Temperature Measurement System For Joint

Brief Introduction

The built-in cable joint conductor temperature measurement system features functions including wireless energy transmission, real-time communication, temperature value analog-to-digital conversion, and overheating protection. The temperature measurement sampling period is adjustable (>30 seconds), and the temperature measurement accuracy is (±0.6° C).

Monitoring the operating temperature of cable joint cores is the core technology of this system. It monitors the operating temperature of cable cores in real time and uploads the temperature to the monitoring platform in real time via ground grid communication technology, laying a foundation for the intelligent management of cables.

The product consists of three parts: a built-in temperature measurement module, an external temperature measurement repeater, and a wireless temperature measurement control module. The temperature measurement module completes the temperature measurement of cable joints and is embedded in the cable joint during the installation and manufacturing of the cable joint. The wireless temperature measurement signal acquisition module provides electrical energy for the temperature measurement module and collects the measured joint temperature. The wireless temperature measurement control module coordinates the work of each wireless temperature measurement signal acquisition module, aggregates the temperatures of the A, B, and C phase joints, and transmits data to the upper-level system via the MODBUS protocol.

Technical Parameters

Operating Ambient Temperature	Temperature Measurement Module	0℃~+100℃
	Wireless Temperature Measurement Signal Acquisition Module	-40℃~+85℃
Operating Ambient Humidity	10% - 100%	
Atmospheric Pressure	70KPa - 106KPa	
Protection Class	Temperature Measurement Module	IP67
	Wireless Temperature Measurement Signal Acquisition Module	IP67
	Wireless Temperature Measurement Signal Acquisition Module	IP67
Working Power Supply	It can work normally within the range of rated voltage (15V) ±20%.	
Total Machine Power Consumption	Three-Phase Simultaneous Temperature Measurement	≈15W
	idle	≈2.5W
Temperature Measurement Accuracy	±1℃	
Service Life	⩾ 30 Years	

System Composition

1-Built-in Temperature Measurement Module

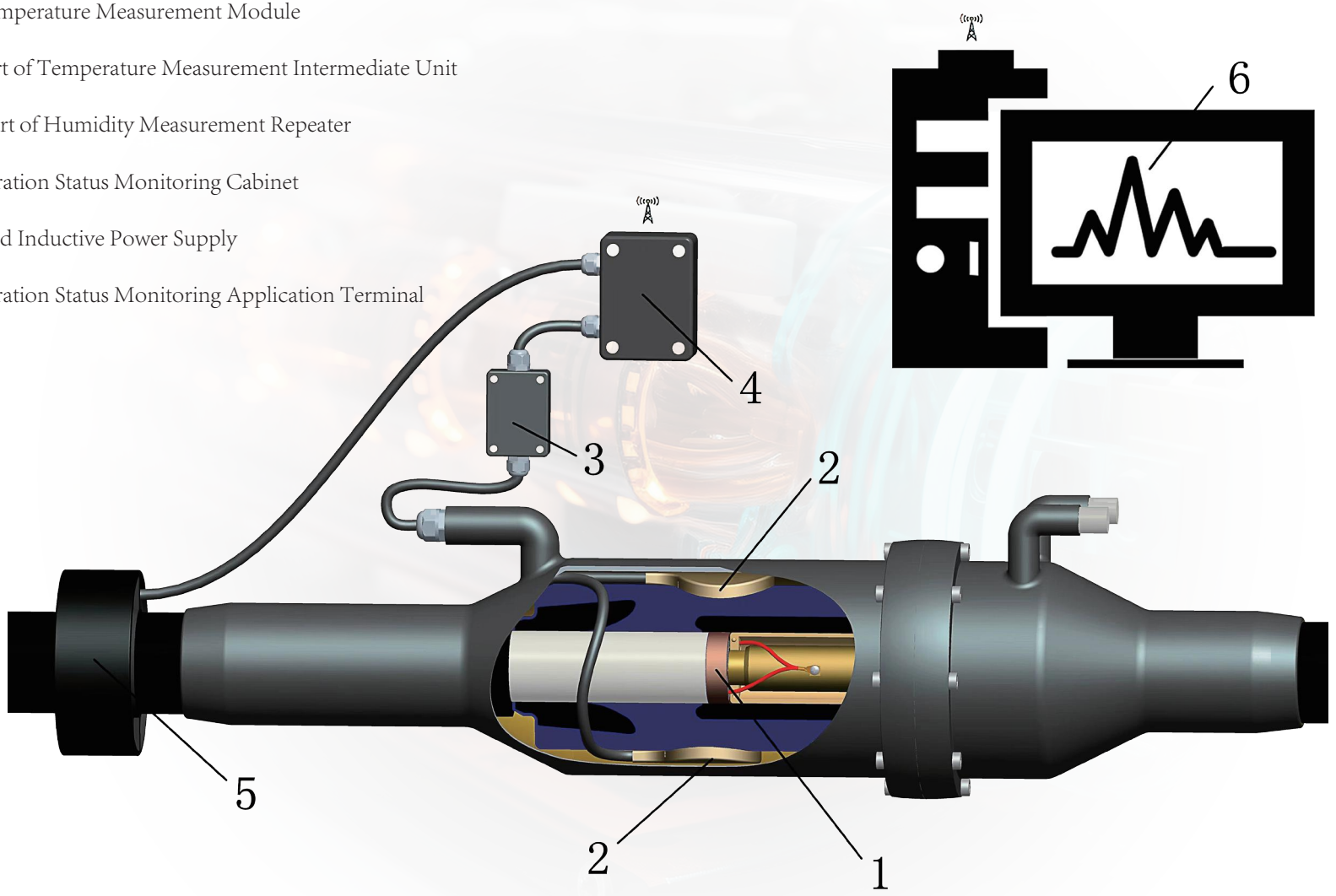
2-Built-in Part of Temperature Measurement Intermediate Unit

3-External Part of Humidity Measurement Repeater

4-Cable Operation Status Monitoring Cabinet

5-Non-Closed Inductive Power Supply

6-Cable Operation Status Monitoring Application Terminal



Welding Seal Monitoring System For HV Cable Accessories

Brief Introduction

Lead sealing is one of the key processes in the installation of high-voltage cable accessories. It is used to achieve electrical connection between the accessory's copper shell or tail pipe and the cable's aluminum sheath, while also serving the function of sealing and waterproofing. Once the lead seal cracks, the accessory will be exposed to water and moisture intrusion, or cause electric field distortion. At the same time, it will lead to imbalance in the grounding system, resulting in increased grounding current, which is highly likely to trigger breakdown faults.

The electromagnetic penetration effect technology is adopted to monitor the lead seal status at both ends of the cable joint. Electromagnetic sensors are wrapped between the lead seal of the cable accessory and the metal sheath. When defects such as cracking or damage occur at the lead seal, the electromagnetic matrix sensor is used to monitor real-time changes in the intensity of electromagnetic signals, thereby realizing defect assessment and early warning of the operational status of the cable lead seal.

System Composition

1-Electromagnetic Lead Seal Monitoring Sensor

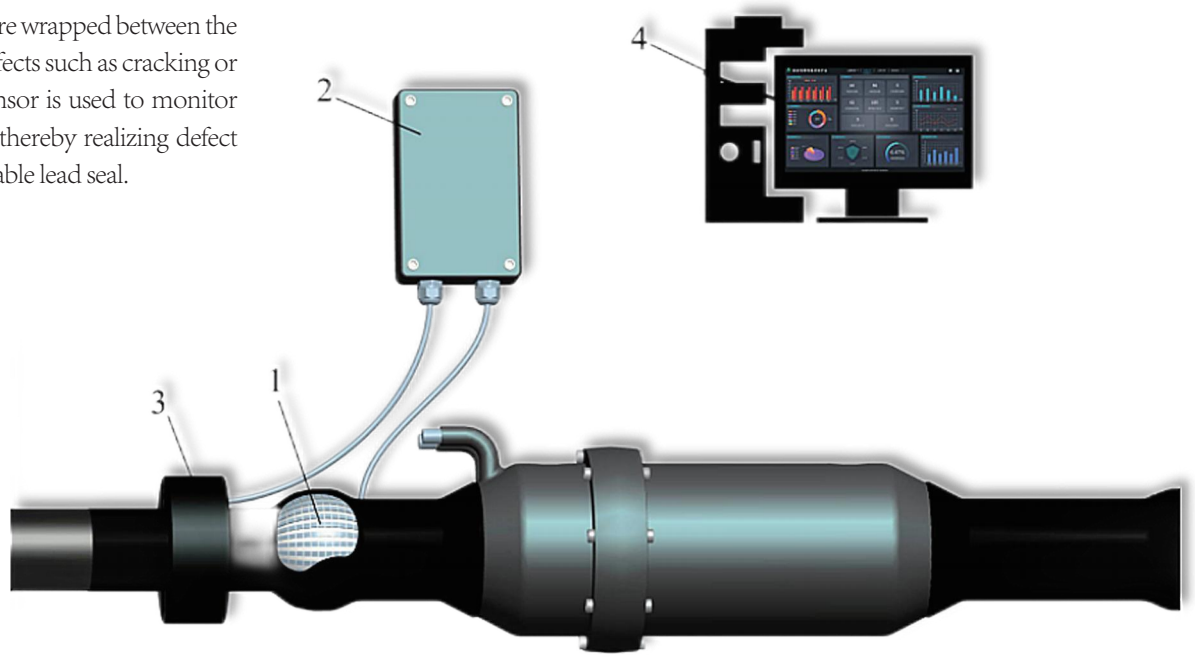
2-Lead Seal Monitoring and Acquisition Device

3-Inductive Power-Taking Supply

4-Cable Lead Seal Operation Status Monitoring Cabinet

Technical Parameters

Project	Technical Parameter
Operating Frequency	915MHZ
Monitoring Sensitivity	⩽1mm
Operating Voltage	DC 5V-12V
Operating Power Consumption	⩽ 5W
Standby Power Consumption	⩽0.3W
Terminal Communication	4G, Fiber Optic Communication
Operating Temperature	-40℃~+85℃
Operating Ambient Humidity	10%RH-98%RH
Atmospheric Pressure	70kPa-106kPa



DTS Distributed Fiber Optic Temperature Monitoring System

Brief Introduction

The Distributed Fiber Optic Temperature Sensing (DTS) System DTS2000 is one of the world’s most advanced linear temperature-sensing fire detectors. It directly uses optical fiber as a sensor: through filtering and detection of weak backscattered Raman signals in the optical fiber, as well as high-speed data acquisition and analysis, it obtains temperature-sensitive anti-Stokes signals and temperature-insensitive Stokes signals. This enables real-time acquisition of accurate temperature information distributed along the optical fiber, with a maximum measurement distance of 20 km, a measurement accuracy of 0.5℃, and a minimum measurement time of 2 seconds.

Combined with an advanced intelligent fire alarm algorithm, the system achieves real-time online monitoring of the entire length of the sensing optical fiber and accurate positioning of locations with abnormal temperatures. The Distributed Fiber Optic Temperature Sensing System DTS2000 has wide applications in fields such as electric power, power plants, transportation, dams, petrochemicals, and coal mines.

Product Features

Long Measurement Distance: Supports a maximum distance of 20 km

High Measurement Accuracy: Achieves a minimum accuracy of 0.5 ℃

Fast Measurement Speed: Reaches a maximum speed of 2 seconds per channel

High Spatial Resolution: Features a minimum resolution of 0.5 (note: please supplement the unit according to actual technical specifications, such as "0.5 m" or "0.5 m per point", to ensure parameter completeness)

Multiple Measurement Channels: One host supports a maximum of 16 measurement channels

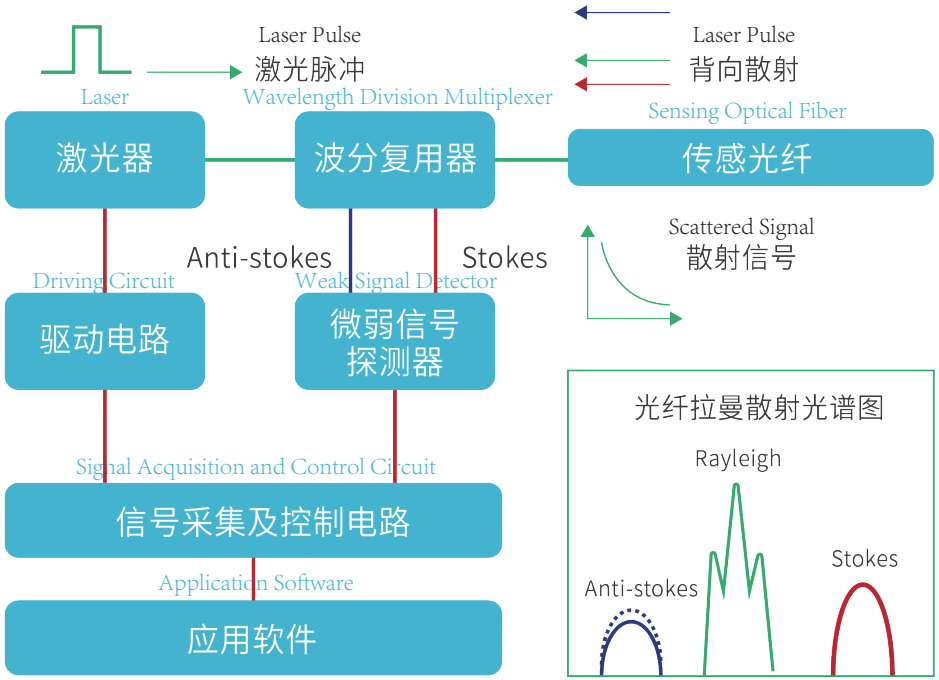
Equipped with underlying ARM computing and analysis (capabilities): Boasts high reliability, integrated self-diagnosis function, and enables rapid fault localization



Working Principle

The Distributed Fiber Optic Temperature Sensing (DTS) System DTS2000 simultaneously realizes temperature measurement and spatial positioning functions. Among them, temperature measurement utilizes the spontaneous Raman scattering effect of optical fibers, while spatial positioning adopts the Optical Time-Domain Reflectometry (OTDR) technology.

High-speed narrow-pulse-width semiconductor laser pulses are coupled into the sensing optical fiber. Through the filtering and detection of weak backscattered signals in the optical fiber, as well as high-speed data acquisition and analysis, temperature-sensitive anti-Stokes signals and temperature-insensitive Stokes signals are obtained. This enables real-time acquisition of accurate temperature information distributed along the optical fiber. Combined with an advanced intelligent fire alarm judgment algorithm, the system achieves real-time online monitoring of the entire length of the sensing optical fiber.



Optical Fiber Raman Scattering Spectrum

Technical Parameters

Product Type	DTS2000-MM	DTS2000-HR	DTS2000-SM
Measuring Optical Fiber	SM9/125		
Measuring Distance	0-20km	0-4km	0-10km
Measuring Time	2-30 s	10-30 s	30-60 s
Temperature Measurement Error	±0.5/1.0℃	±1.0℃	±1.0℃
Temperature Measurement Resolution	0.1℃		
Sampling Interval	0.5/1 m	0.2	0.5/1 m
Spatial Resolution	1-3 m	0.5 m	1-3 m
Positioning Accuracy	<1 m	<0.5 m	<1 m
Measuring Channel	--	1/2/4/8/16	Ground Grid, GPRS,MODBUS
Measuring Range	(-40 ~ +85) ℃ (for conventional optical fibers), (-190 ~ +300) ℃ (for special optical fibers)		
Optical Fiber Connector	FC/APC,E2000/APC(Optional)		
Communication Interface	LAN/RS485/RELAYS		
Operating Conditions	(-10~+50) ℃ ,0-95R.H.(No Condensation)		
Operating Power Supply	220V AC,24V DC(Optional)		
Equipment Dimensions	48(W)x447(D)x89(H)mm,19-inch Rack-mount		

Intelligent Liquid Level Monitoring System For Outdoor Termination

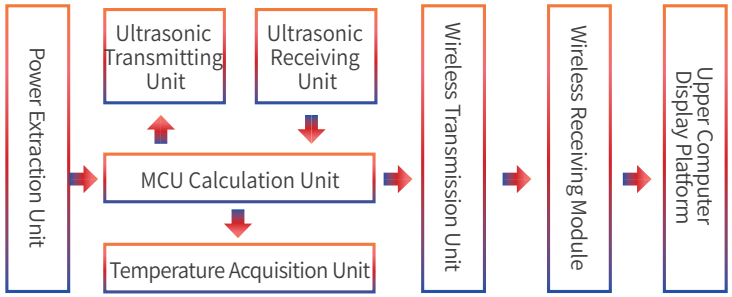
Brief Introduction

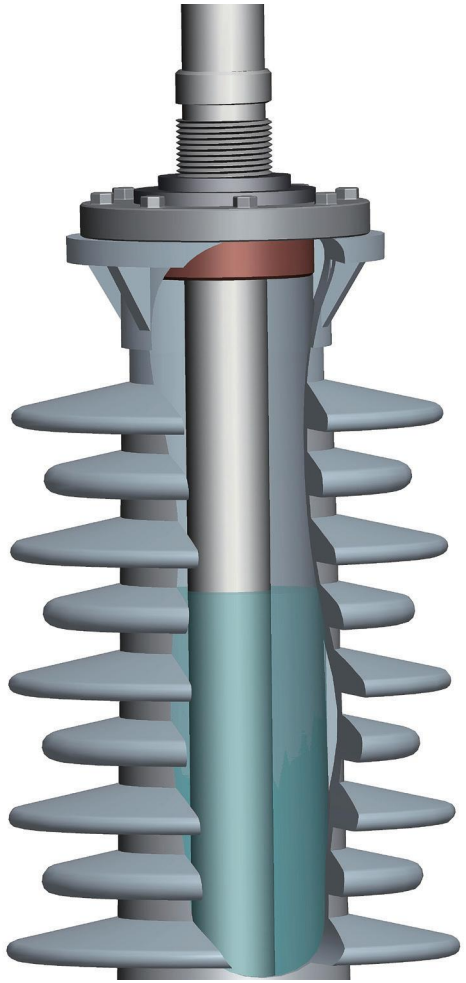
The intelligent oil level monitoring system for outdoor terminals uses ultrasonic waves to detect the height of sealed oil. Ultrasonic waves feature high frequency, short wavelength, minimal diffraction, and good directionality, allowing them to propagate directionally as a beam. They experience very little attenuation in liquids and solids, thus having strong penetration capabilities. Particularly in solids that are opaque to light, ultrasonic waves can penetrate tens of meters. When they encounter impurities or interfaces, significant reflection occurs. This characteristic is utilized to calculate the height of the sealed oil.

The system adopts power extraction technology to supply power to the equipment and uses wireless signal transmission technology for data transmission. This enables the collection and transmission of signals without altering the existing construction environment in any way.

System Composition

The intelligent oil level monitoring system for outdoor terminals consists of a power extraction control unit, a temperature monitoring unit, a wireless transmission unit, an ultrasonic transmitting unit, an ultrasonic receiving unit, an MCU calculation unit, and a wireless receiving module. The working mode between each unit is as shown in the figure below:





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Product Feature

It can monitor the liquid level height of insulating oil inside porcelain bushings/composite bushings.

The compensation device can maintain stable pressure in the sealed container, unaffected by the thermal expansion and contraction of insulating oil and gas, thereby ensuring the accuracy of data measured by the pressure sensor.

The terminal is equipped with a data remote transmission function, enabling remote transmission of all signals.

Power acquisition methods include: solar power acquisition, CT inductive power acquisition, AC220V, and DC48/72V.

Transmission methods include: GPRS, 4G, SMS, wireless point-to-point transmission, WIFI, and optical fiber Ethernet; a SIM card must be inserted for GPRS, 4G, and SMS transmission methods.

Technical Parameters

Project	Technical Parameters
Measurement Accuracy	±10mm
Measurement Range	30-1000mm
Operating Power Supply	CT Power Acquisition, AC220V, Solar Energy
Data Transmission Method	GPRS, 4G, SMS, Wireless Point-to-Point Transmission, Optical Fiber
Mean Time Between Failures (MTBF)	More than 50,000 hours
Operating Current	Minimum 3mA, Maximum 120mA
Operating Ambient Temperature	-55~+85
Operating Ambient Humidity	15%-98%RH
Atmospheric Pressure	86-106kPa

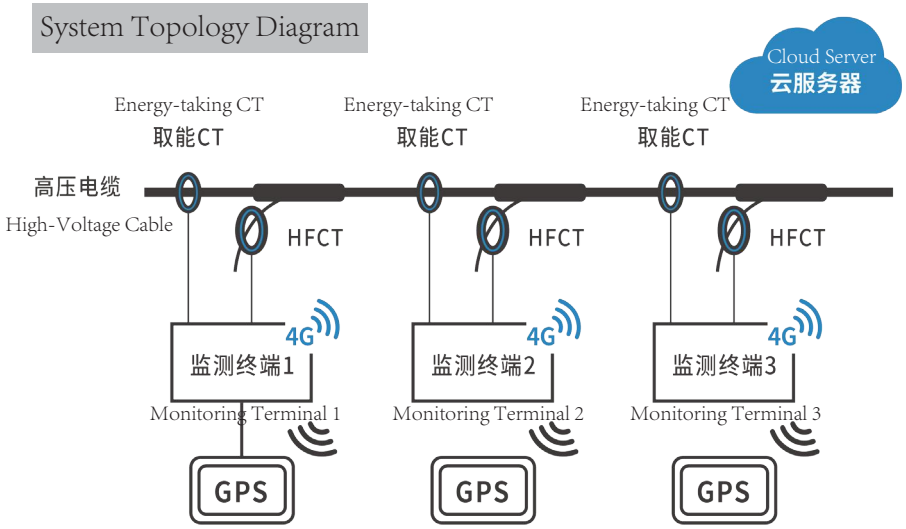
Fault Warning & Positioning For Cable System

Brief Introduction

The Cable Fault Early Warning and Precise Positioning System is mainly applied to high-voltage cable lines with long distance and large cross-section of 110kV and above in cable tunnels. It can quickly identify faulty cable lines and the position of fault points relative to the terminals of cable lines, which greatly shortens the fault detection time, enables rapid repair of cable faults, and improves the reliability of the power supply system.

This system adopts the GPS double-end positioning time-base method. It collects signals in real time through traveling wave sensors installed on the cable body or grounding wire, and monitors the cable 24 hours a day, 7 days a week. The positioning accuracy can reach 1% + 10 meters. It is powered by AC220V or CT power acquisition and uses 4G wireless communication to ensure the equipment is online at all times.

System Topology Diagram



Working Principle

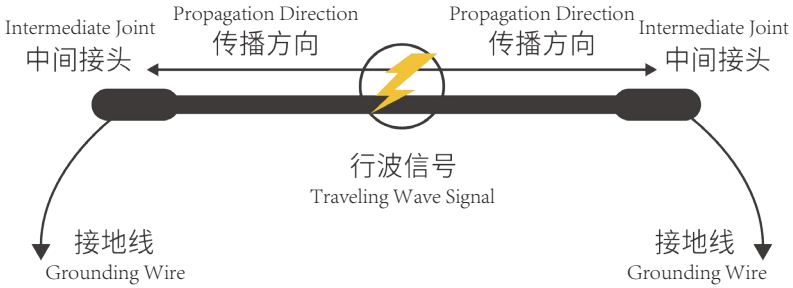
When a fault occurs in a high-voltage cable, it generates non-steady-state quantities with large amplitudes, which propagate from the fault point to both ends—these are called traveling waves. The propagation speed of traveling waves is close to the speed of light, approximately 2.0×10^8 meters per second. The location of the fault point can be determined based on the time when the traveling waves reach the monitoring points at both ends.

Compared with the single-end positioning method, the double-end positioning method only uses the time when the first wavefront of the traveling wave arrives at both ends of the line for calculation. It only needs to capture the first wavefront of the traveling wave, without considering the reflection and refraction of the traveling wave. Additionally, the traveling wave has a large amplitude, making it easy to identify.

The system can adopt GPS timing and synchronize with high-speed integrated circuit chips, which ensures that the error of the measured time difference is within 30 nanoseconds.

Technical Parameters

Item	Technical Parameters
Number of Measurement Channels	Three Channals for each poin
Measurement Frequency Band	0.1-20MHz
Timing Accuracy	⩽30nS
CT Measurement Range	100mA-1.5kA
Maximum Monitorable Distance	20km
Positioning Accuracy	1%+10米
Data Link	485/4G
System Power Supply	CT inducting or external power
Power Consumption per Single Node	⩽10W



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04

FIRE PROOF AND EXPLOSION PROOF PRODUCTS

PART 04

HIGH-QUALITY MATERIALS FORM MULTIPLE PROTECTIVE BARRIERS, REDUCING THE OCCURRENCE OF SECONDARY DISASTERS CAUSED BY FAULTS IN CABLES AND CABLE ACCESSORIES

Explosion-Proof Housing

Brief Introduction

Basic Introduction

Cable joints are often prone to becoming weak points in the line due to factors such as manufacturing conditions and materials. Once an explosion fault occurs, it will not only cause a power outage but also may affect surrounding cables, equipment and personnel, leading to secondary accidents. Installing an explosion-proof protective shell can confine the explosion shock wave and flame within the shell, effectively preventing the accident from expanding and minimizing losses.

Applicable Environment

Temperature: -50℃ ~ 50℃

Altitude: Less than 4000m

It is used for the shell protection of cable intermediate joints in direct burial, manholes or tunnels.

Applicable Scope

Intermediate joints of 10kV-220kV cables

Technical Advantages and Features of the Product

High Mechanical Strength

Strong Corrosion Resistance

High Protection Level

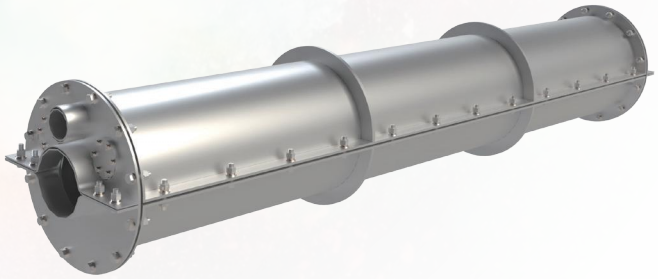
Equipped with Pressure Relief Function / Has Pressure Relief Capability



Explosion-proof SMC housing for joint
(Model: FBKS)



Explosion-proof Al-Magnesium alloy housing for joint
(Model: FBKLM)



Explosion-proof stainless steel housing for joint
(Model: FBHG)

Fire & Explosion Proof Tray For Joint

Brief Introduction

Basic Introduction

The fire and explosion-proof trough is specially designed for cable joints. It adopts a composite structure of 304 stainless steel plates and inorganic calcium silicate fiber plates, with fire-proof materials filled inside. It can be equipped with accessories such as intelligent temperature-sensing fire-extinguishing devices and fire and explosion-proof blankets. By blocking explosion shocks and suppressing flame spread, it effectively prevents secondary hazards caused by cable faults and ensures the safety of the surrounding area.

Applicable Scope

Joints of 10kV-220kV cables

Technical Advantages and Features of the Product

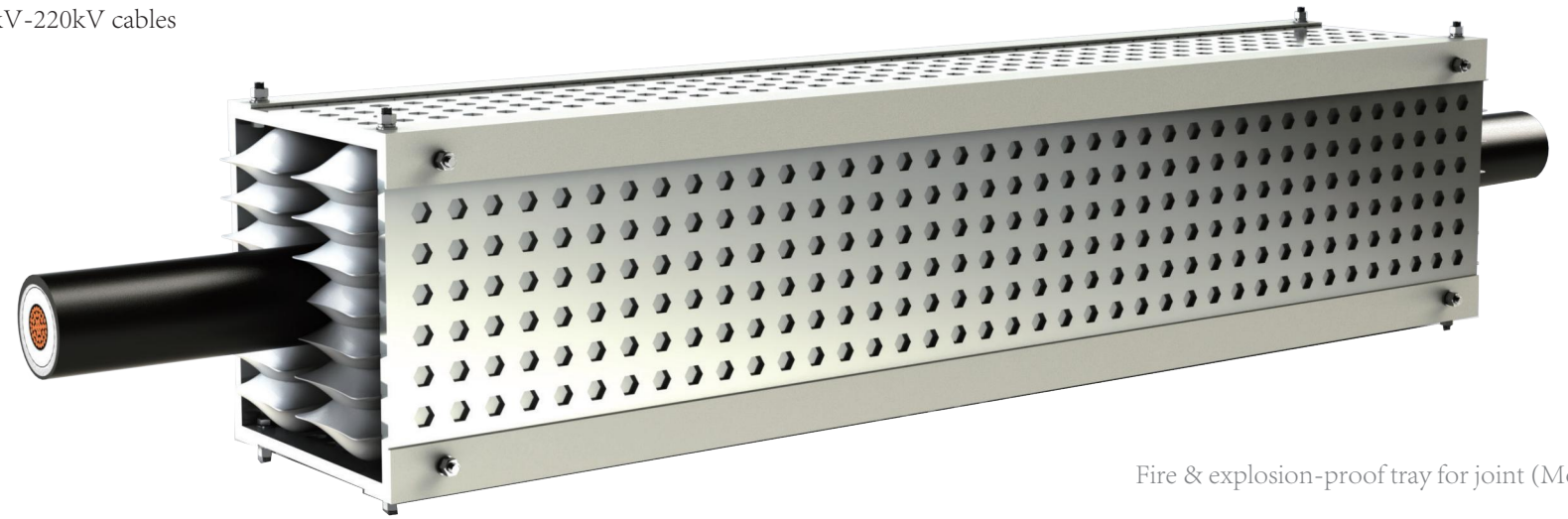
Fire and Explosion Protection: The main body uses 304 stainless steel panels to eliminate electric field eddy currents; the inorganic calcium silicate fiber panels meet Class A1 flame-retardant requirements, and the explosion resistance capacity reaches 2000KPa.

High Strength and Durability: Flexural strength of 85MPa, design service life ⩾ 30 years, and adaptable to extreme environments from -50℃ to +50℃.

Corrosion Resistance: All materials are corrosion-resistant, suitable for complex working conditions such as tunnels and cable trays.

Flexible Adaptability: The size of the trough can be adjusted according to the joint structure to meet the needs of complex working conditions.

Multiple Protections: Can be flexibly configured according to user requirements.



Fire & explosion-proof tray for joint (Model: FBCH)

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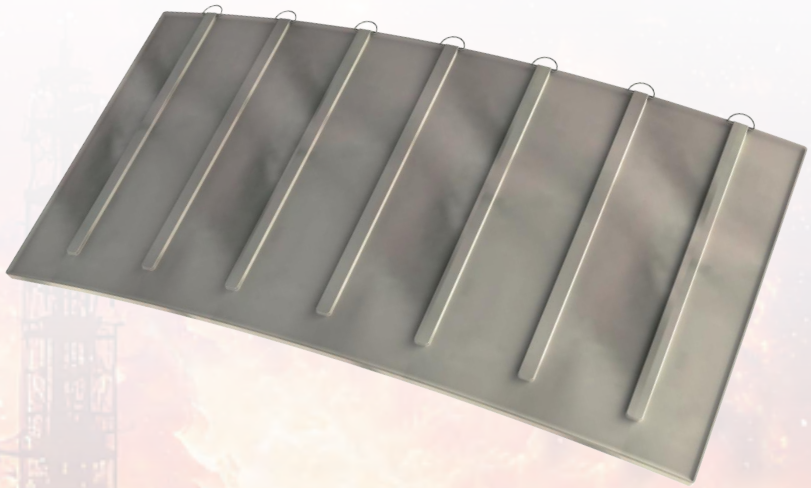
Fire & Explosion Proof Blanket

Brief Introduction

As weak links in cable systems, the real-time monitoring of the operating status of cable accessories is crucial for ensuring the safety of lines. In the event of a fault, the use of fire and explosion-proof blankets can significantly reduce the risk of damage to personnel and equipment caused by the accident.

Fire and explosion-proof blankets are made with high-temperature-resistant composite materials such as flexible nano-insulating fibers as the core, formed through multi-layer stacking and weaving, and possess the dual properties of flame resistance and impact resistance. Their working principle is to block the spread of flames through a dense fiber structure, while utilizing the material's ductility to absorb explosion shock waves, thereby quickly preventing the spread of dangerous situations. These blankets are lightweight and highly flexible; they can be pre-covered on key parts such as cable accessories, and can also be quickly laid out in the early stages of a fault. They are suitable for various scenarios including high-voltage and low-voltage cable terminations and joints. No professional skills are required for operation, and a single person can complete the process. By gaining valuable time for emergency response, they serve as an important supplement to the electrical safety protection system.



Fire Blanket (Model: GLFHT)

Fireproof and heat-insulating, with high temperature resistance up to 1300 ℃

Thermal conductivity of 0.065W/(m · k), and fire resistance rating of 90 minutes

Combustion performance reaches Class A1, and tensile strength reaches 20KPa

Equipped with built-in strapping, easy to install, no additional fixing tools required

Halogen-free, non-toxic, asbestos-free, safe and environmentally friendly

Fire and Explosion-Proof Blanket (Model: GLFHBT)

It occupies little space after installation and can meet various application scenarios

Fireproof and heat-insulating, with high temperature resistance up to over 1200 ℃

Double-layer design with a built-in metal layer, featuring explosion-proof function

Built-in flexible nano heat-insulating fibers, which effectively enhance fire and heat insulation performance

Halogen-free, non-toxic, asbestos-free, safe and environmentally friendly

Fireproof Self Adhesive Tape

Brief Introduction

Basic Introduction
When a sudden line fault occurs, the externally wrapped flame-retardant, fire-proof, and self-adhesive tape can quickly form a barrier. It not only delays the spread of fire but also significantly reduces secondary hazards caused by arc discharge or high temperatures, providing double safety protection for personnel and equipment.

Product Specifications
0.7x60x5000mm

Executive Standards
XF 478-2004 Flame-Retardant Tapes for Cables
GB/T 2406.2 Plastics - Determination of Burning Behavior by Oxygen Index Method - Part 2: Room Temperature Test

Application Scenarios
Suitable for fire protection of high-voltage and low-voltage power supply lines, especially for cable fire protection in environments such as substations, subways, coal mines, tunnels, chemical or mining industries, communication equipment rooms (for cables), fire-fighting pipelines, and high-rise large-scale buildings.

Technical Advantages and Features of the Product

Made of special polymer materials, it has excellent fire resistance and arc resistance, and can effectively prevent combustion.

Environmentally friendly, non-toxic, odorless, solvent-free and pollution-free.

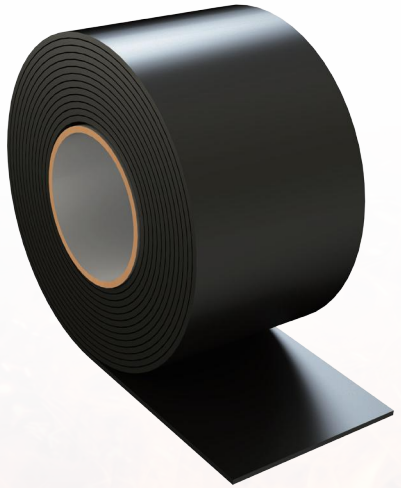
It has self-adhesive property and good sealing performance, and is resistant to acids, alkalis, salts, sewage and ultraviolet rays.

Soft, with good conformability and excellent high elasticity, it can be used for fire protection in various environments.

Complies with China's Public Security Industry Standard XF 478-2004 Flame-Retardant Tapes for Cables.

Oxygen index of 62, which is higher than the national standard requirement (>45).

Carbonization height: 0.98m, which is better than the national standard requirement (≤2.5m).



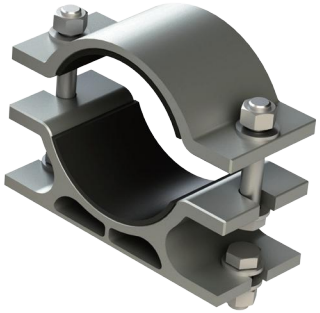
Fireproof self - adhesive tape (Model: GLFHD - 90)

05 CABLE CLAMP

PART 05

BASED ON HIGH-STRENGTH MATERIALS AND SIMULATED MECHANICAL DESIGN, THE LONG-TERM STABILITY OF CABLE CLAMPS DURING OPERATION UNDER EXTREME WORKING CONDITIONS IS ACHIEVED

Extruded Aluminum Alloy Cable Clamp



Brief Introduction

Product Model: JGWD

Executive Standard: GB/T 2314-2008

Applicable Scope: Suitable for cables with an outer diameter of 40mm to 160mm; used for cable fixing in 35kV-500kV cable laying lines

Technical Specifications

Material: 6061 Aluminum Alloy, which belongs to the Al-Mg-Si alloy system and has high strength and high corrosion resistance.

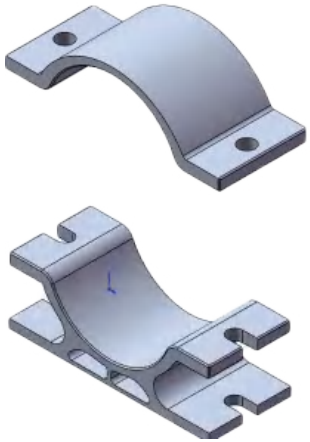
Main Performance Indicators of the Material:
Tensile Strength Rm = 260MPa

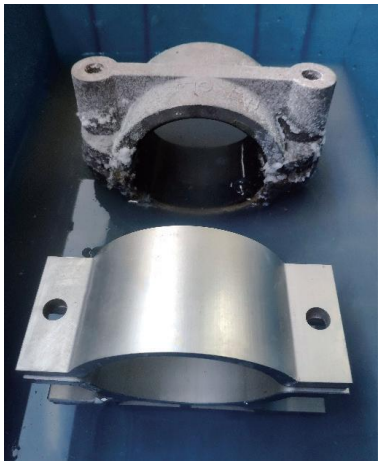
Specified Non-Proportional Extension Strength Rp0.2 = 240MPa

Technical Advantages and Features of the Product

This product is made of super-hard anti-corrosion 6061 Al-Mg alloy. Verified by mechanical simulation and tests, it enables more uniform force distribution on cables and more secure clamping. The most advanced extrusion production process is adopted, which significantly improves the surface finish, mechanical strength, corrosion resistance and fatigue resistance of the cable clamp.

This product is a patented product, which has been well received by users in engineering applications and has obvious advancement.





Comparison test on corrosion resistance with ordinary cast aluminum alloy clamps

Model	JGWD-1	JGWD-2	JGWD-3	JGWD-5	JGWD-6
Applicable Cable Outer Diameter	Ø40-55	Ø 55-75	Ø 72- 102	Ø102- 132	Ø132-Ø162

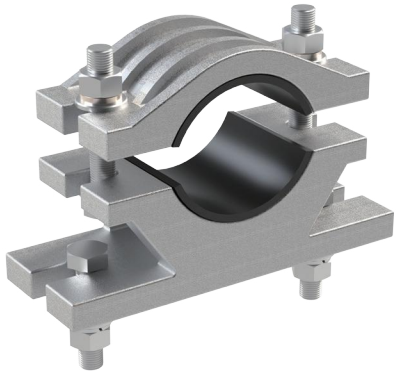
Aluminum Alloy Cast Cable Clamp (For Single Cable)

Brief Introduction

Product Model: JGW

Executive Standard: GB/T 2314-2008

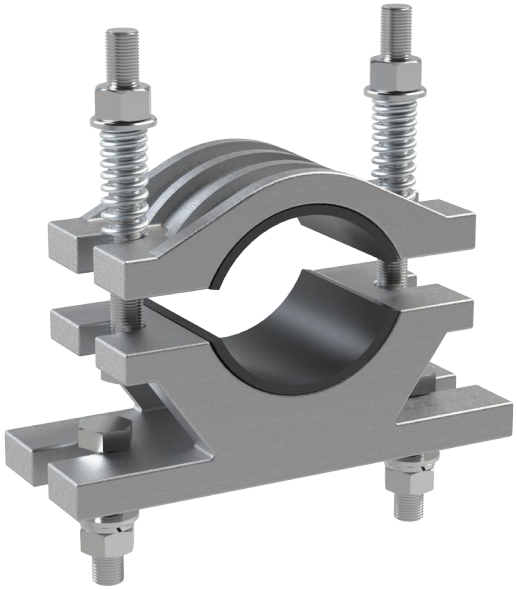
Applicable Scope:
Suitable for fixing single cables with an outer diameter of 40mm to 160mm; used in 35kV-500kV cable laying lines



Technical Specifications

Material: Cast Aluminum Alloy

Main Performance Indicators: σb - 235MPa, δs - 2%, HBS - 70



Technical Advantages and Features of the Product

The product is made of anti-corrosion cast aluminum alloy. Verified by mechanical simulation and tests, it ensures more uniform force distribution on the cable, stronger clamping force and better anti-corrosion performance.

Model	JGW-0	JGW-1	JGW-2	JGW-3	JGW-4	JGW-5	JGW-6	JGW-7
Applicable Cable Outer Diameter (mm)	Ø 45- Ø 70	Ø 70- Ø 80	Ø 80- Ø 95	Ø95- Ø 105	Ø105- Ø 120	Ø120- Ø 135	Ø 135- Ø 150	Ø 150- Ø 165

Aluminum Alloy Cast Cable Clamp (For Three Cables)



Brief Introduction

Product Model: IGP

Executive Standard: GB/T 2314-2008

Applicable Scope:
Suitable for centralized fixing of three cables with an outer diameter of 40mm to 160mm; used in 35kV-500kV cable laying lines

Material: Cast Aluminum Alloy

Main Performance Indicators: σb - 235MPa, δs - 2%, HBS - 70

The product is made of anti-corrosion cast aluminum alloy. Verified by mechanical simulation and tests, it ensures more uniform force distribution on the cables, stronger clamping force, and better anti-corrosion performance.

Model	JGP-1	JGP-2	JGP-3	JGP-4	JGP-5	JGP-6	JGP-7	JGP-8	JGP-9
Applicable Cable Outer Diameter (mm)	Ø 40- Ø 55	Ø 55- Ø 70	Ø 71- Ø 80	Ø80- Ø 90	Ø90- Ø 100	Ø100- Ø 114	Ø 115- Ø 130	Ø130- Ø 145	Ø145- Ø 160

Fiberglass Cable Clamp

FRP Cable Clamp (Single Cable)

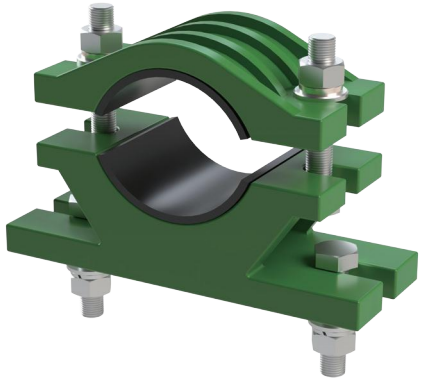
Brief Introduction

Product Model: FJG(H)

Executive Standard: GB/T 2314-2008

Applicable Scope:
Suitable for fixing single cables with an outer diameter of 80mm to 160mm; used in 35kV-500kV cable laying lines in high-salinity-alkalinity and high-corrosion areas

Main Material: SMC



It has excellent flame-retardant performance. Made of high-quality SMC raw materials through die-casting molding, it is not prone to embrittlement or chalking during long-term outdoor use, and has extremely strong resistance to acids, alkalis, salts, most solvents, humid environments, seawater, industrial atmosphere, etc.

Model	FJG(H)-1	FJG(H)-2	FJG(H)-3	FJG(H)-4
Applicable Cable Outer Diameter	Φ180~Φ105	Φ105~Φ125	Φ125~Φ140	Φ140~Φ160

FRP Cable Clamp (Three Cables)

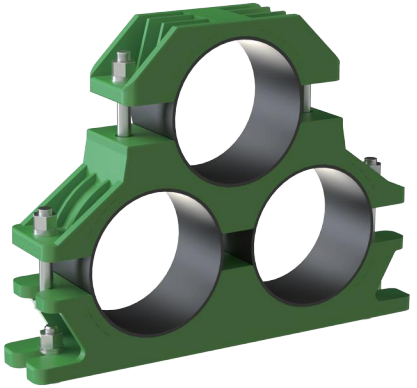
Brief Introduction

Product Model: FJGPD

Executive Standard: GB/T 2314-2008

Applicable Scope: Suitable for centralized fixing of three cables with an outer diameter of 80mm to 160mm; used in 35kV-500kV cable laying lines in high-salinity-alkalinity and high-corrosion areas

Main Material: SMC



Technical Advantages and Features of the Product

It has excellent flame-retardant performance. Made of high-quality SMC (Sheet Molding Compound) raw materials via die-casting molding, it is not prone to embrittlement or chalking during long-term outdoor use, and exhibits extremely strong resistance to acids, alkalis, salts, most solvents, humid environments, seawater, industrial atmosphere, and more.

Model	FJGPD-5	FJGPD-6	FJGPD-7	FJGPD-8	FJGPD-10
Applicable Cable Outer Diameter	Φ70~Φ90	Φ90~Φ115	Φ110~Φ130	Φ130~Φ150	Φ140~Φ160

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