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KFW5 系列万能式断路器 KFW5 Series Air Circuit Breakers

智能互联 开启数字化配电之旅
Connected Intelligence Start Digital Power Distribution

About KFINE

关于凯帆

大全集团，主要从事高低压成套电气设备、智能元器件及光伏新材料的研发与制造；产业涵盖电气、新能源、轨道交通等领域；公司管理、制造水平及产品质量居行业前列；在全国拥有4大生产基地、23家制造企业、3个研究院、超万名员工；参与国家和行业标准制订11项、承担国家和省部级科技项目54项；先后荣获国家技术发明二等奖、国家科学技术进步一等奖、国家科学技术进步特等奖，是国家企业技术中心、智能制造试点示范、国家绿色工厂、全国用户满意标杆企业。

江苏大全凯帆开关股份有限公司是国家高新技术企业，主要生产低压配电电器、工业控制电器、智能配电系统等产品。低压断路器产品的核心部件操作机构、控制器、触头灭弧系统实现自主研发和完全自主知识产权，实现自主制造，具备模具加工中心、SMT贴片中心、零部件加工中心、检测中心、自动化装配线完整的生产制造体系。下设全资子公司昆山大全精密模具有限公司实现模具智能制造，保证产品开发进度和零件质量。荣获江苏省两化融合示范企业、江苏省示范智能车间等认定。

大全凯帆坚持质量第一，追求卓越管理，拥有行业领先的制造、检测、试验设备；通过信息化、数字化与自动化融合，推动数字制造新模式；建立了完善的管理体系，确保准时为客户提供性能优异、质量可靠的产品。公司各类产品深受用户好评，已广泛应用于电力、机械、交通、矿山、冶金、石化、建筑、船舶、核电和新能源等领域，多次获得省市级质量奖。

展望未来，大全凯帆将坚持观念创新、管理创新、科技创新和营销创新，加速推进企业标准化建设，全面推进产品数字化、低碳化、管理信息化、生产智能化、服务网络化，实现“数字制造”的转型升级，朝着先进制造企业的目标迈进，为客户提供智能可靠的数字化配电产品！

DAQO Group has been mainly engaged in research, development and manufacturing of low and high-voltage electrical equipment assemblies, intelligent components and new photovoltaic materials; it covers the industries such as electric power, new energy, rail transit, etc.; it has taken a leading position in the company management, manufacturing level and product quality; it has established 4 production bases, 23 manufacturing enterprises and 3 research institutes, with more than 10,000 employees; it has participated in the formulation of 11 national and industry standards, and undertook 54 national and provincial science and technology projects; it has won the second prize of National Technological Invention, the first prize of National Science and Technology Progress, and the special prize of National Science and Technology Progress. It has become a national enterprise technology center, demonstration pilot of intelligent manufacturing, national green factory and national benchmark enterprise for customer satisfaction.

As a national high-tech enterprise, Jiangsu DAQO KFINE Switch Co., Ltd. has been mainly engaged in the production of low-voltage distribution appliances, industrial control appliances, intelligent distribution systems and other products. For the core components of the low-voltage circuit breaker such as operating mechanism, controller and contact arc extinguishing system, it has achieved the independent research and development and the fully independent intellectual property rights, realized the independent manufacturing and established a complete production and manufacturing system with mold processing center, SMT patch center, parts processing center, testing center and automated assembly line. Kunshan DAQO Precision Mold Co., Ltd., a wholly-owned subsidiary, has achieved intelligent manufacturing of molds to ensure product development progress and component quality. It has been awarded as a demonstration enterprise for two-oriented integration in Jiangsu Province, and an intelligent demonstration workshop in Jiangsu Province.

DAQO KFINE has adhered to quality first and pursued excellence in management, with industry-leading equipment in manufacturing, inspection and testing; it has promoted the new model of digital manufacturing by the integration of informatization, digitalization and automation; it has established a sound management system to ensure timely supply of products with excellent performance and reliable quality. All kinds of products from DAQO KFINE have been well received by users, and have been widely used in electric power, machinery, transportation, mining, metallurgy, petrochemical industry, construction, shipbuilding, nuclear power, new energy and other fields, which have won provincial and municipal quality awards for many times.

In the future, DAQO KFINE will adhere to concept innovation, management innovation, scientific and technological innovation and marketing innovation, accelerate the standardization of enterprise construction, comprehensively promote digitalization of products, low-carbon production, IT management, intelligent production and networked services, realize the transformation and upgrading to "digital manufacturing", and move toward the goal of advanced manufacturing enterprises, in order to provide the customers with intelligent and reliable digital power distribution products!



大全凯帆专注技术创新，建有“博士后科研工作站”、“江苏省智能低压电器工程技术研究中心”、“江苏省研究生工作站”等创新平台，检测中心获中国合格评定国家认可委员会认可。公司拥有近 150 人的创新团队，各类创新成果多次获得省部级以上荣誉。

DAQO KFINE has focused on technological innovation and has built the innovation platforms such as "Postdoctoral Research Workstation", "Jiangsu Intelligent Low-voltage Electrical Engineering Technology Research Center", "Jiangsu Graduate Workstation", etc., and its testing center has been recognized by the China National Accreditation Service for Conformity Assessment. DAQO KFINE has established an innovation team of nearly 150 members and has won provincial and ministerial honors for many times with various innovation achievements.

产品保障

可靠

RELIABLE PRODUCT ASSURANCE

凭借数字化设计、严选材质、数字化制造及严格的质量控制体系，为客户低压电气系统运行提供可靠的品质保障。

With digital design, strict material selection, digital manufacturing and strict quality control system, we can provide reliable quality assurance of low-voltage electrical system operation for the customers.

数字化设计 Digital design

凯帆开关具备博士后工作站、研发中心、企业技术中心、电气检测站等研究机构，形成完备的三级科研创新体系，配备高精尖研发团队；研发过程采用国际先进的CAD设计软件及CAE仿真技术，提升产品数字化水平和可靠性；新一代数字化产品实现智能互联，让保护更加简单便捷。获得德国“IF”奖，及国家首批“绿色产品认证”。目前授权专利200多项，发明专利50多项，主持或参与多项国家、行业标准制定。

DAQO KFINE has built the research institutions such as postdoctoral workstation, R&D center, enterprise technology center and electrical testing station and established a complete three-level scientific research and innovation system with a sophisticated R&D team; international advanced CAD design software and CAE simulation technology have been adopted for the research and development process to improve the digital level and reliability of products; the new generation of digital products can enable connected intelligence for the easier and more convenient protection. DAQO KFINE has won the German "IF" award and the first "green product certification" in China. Up to now, it has owned more than 200 authorized patents and more than 50 invention patents, and has presided over or participated in the formulation of many national and industry standards.



200+ 项

50+ 项

严选材质 Strict Selection of Materials

为确保选材质量稳定可靠，材质选取全球优质供应链，90%以上材料可回收再利用，满足REACH、RoHS标准。

In order to ensure the stable and reliable quality of the selected materials, the materials are selected from the global high-quality supply chain, and more than 90% of the materials can be recycled to meet the REACH and RoHS standards.



数字化制造 Digital Manufacturing

通过ISO9001体系认证，产品皆通过GB及IEC标准规定的严格测试要求，可靠性达国际先进水平；具备行业领先的模具智能制造工厂，具备SMT贴片中心、钣金加工中心、挤压塑生产中心、数字化焊接车间、智能化立体仓库等完整的制造体系，配备齐全的工装夹具和检测设备，采用智能化流水线，保证产品生产过程的稳定控制。

Our products have passed the ISO9001 system certification and the strict test requirements stipulated by GB and IEC standards, which have reached the international advanced level of reliability; we have built the leading intelligent mold manufacturing factory, established a complete manufacturing system with SMT patch center, sheet metal processing center, extruded plastic production center, digital welding workshop and intelligent three-dimensional warehouse, adopted a complete range of fixtures and testing equipment as well as intelligent assembly lines to ensure the stable control of production.

质量控制体系 Quality Control System

推行ISO9001和ISO90001管理体系，拥有多个检验实验室，配备先进检测设备，具备通断试验、寿命试验、EMC测试、综合特性试验、温度环境测试、湿热环境测试、跌落及振动试验、超声波无损探伤、三坐标测量、3D扫描、高速摄像、材料分析等试验设备，覆盖材质、性能、环境试验等全面检验能力。产品在整个生命周期经过严格全面的质量验证和过程质量控制，保证产品在不同使用环境下可靠运行。

DAQO KFINE has implemented the ISO9001 and ISO90001 management system, built a number of testing laboratories and equipped with advanced testing equipment for on-off test, life test, EMC test, comprehensive characteristic test, temperature environment test, humid and warm environment test, drop and vibration test, ultrasonic non-destructive test, three-coordinate measurement, 3D scanning, high-speed photography and material analysis, covering test capabilities for the material quality, performance and environment test. The products can withstand strict and comprehensive quality verification and process quality control throughout the life cycle to ensure reliable operation in different operating conditions.



专业服务

全面

FULL PROFESSIONAL SERVICE

凯帆始终致力于为客户提供全套服务解决方案，在产品生命周期的各个阶段，为客户提供全方位技术支持。凯帆可提供的技术服务包括：安装、调试、技术培训、维护保养、备件，维修与预防性维护、技术咨询和定制化服务。

DAQO KFINE has always been committed to providing the customers with a full range of service solutions and technical supports in all stages of the product life cycle. Technical services provided by DAQO KFINE: installation, commissioning, technical training, maintenance, spare parts, repair and preventive maintenance, technical consultation and customized services.



技术服务

TECHNICAL SERVICES

销售电话 / Sales Hotline
0511-85128668
技术电话 / Technical Hotline
0511-85120209



服务内容

SERVICE CONTENTS

指导安装操作培训
质保期外服务
Installation guide and operation training
Out-of-warranty services



线上APP

ONLINE APP

问题反馈 派工申请
现场服务 服务报告
Problem feedback Dispatch application
Site service Service reporting



通过手机扫码，可以直接获取产品信息，也可以随时在网上快捷的申请相关服务。

By scanning the code on your phone, you can directly obtain product information and quickly apply for related services online at any time.

轻扫一下 尽在掌控

Scanning for Online Services



KFW5

目录

CONTENTS

亮点
Highlights

A

产品
Products

B

尺寸与安装
Dimensions and installation

C

电气原理图
Electrical diagram

D

特性曲线
Characteristic curve

E

订货信息
Ordering information

F

世界正在不断的变化 我们跟随时代的步伐

With the world constantly changing
Following the pace of the times

推陈出新对产品数字赋能 实现产品数字化转型蜕变

Empowering digital products by innovation
Realizing digital transformation of products



现状 Status

随着现在设备的快速发展，对电力系统提供了更高的要求。
纵观电力系统，以下问题迫切需要我们解决：

With the rapid development of equipment, the higher requirements have been proposed for power systems. Urgent issues for the power systems:

- 设备运维成本高
High cost for equipment operation and maintenance
- 精细化管理难
Difficult refined management
- 数据采集精度低
Low accuracy of data acquisition
- 无法及时清除故障
Failure of timely fault removal
- 分布式能源管理困难
Difficulties in distributed energy management



机会 Opportunities

当前，数字化社会变革，网络技术发展，绿色低碳要求已成为世界共识，配电系统数字化转型变革是大势所趋。

With the transformation of digital society, the development of network technology and the green and low-carbon becoming the consensus of the world, the digital transformation of power distribution systems has become the general trend.

- 碳达峰，碳中和
Carbon peak, carbon neutral
- 配电物联网技术
IOT technology of power distribution
- 削峰填谷，需求侧管理
Peak shaving, demand side management
- 工业4.0数字化转型
Industry 4.0 digital transformation
- 5G时代+物联网
5G era+IOT

面对未来变局，凯帆可提供数字化产品解决方案，助您完成数字化转型之旅。
For future changes, KFINE can provide digital product solutions to help your digital transformation.

KFW5 万能式断路器概述

Introduction to KFW5 series air circuit breakers

为适应智能配电及绿色低碳发展的趋势,借助云计算、大数据、人工智能领域的快速发展,我们推出KFW5系列万能式断路器,其额定电流最高可达7500A。从传统简单的配电系统到精密复杂的电气系统,该款断路器均能以简便、高效的方式进行有效控制,使用绿色环保材料,对环境的影响最小,实现断路器向数字化的蜕变,满足您未来的智能配电需求。产品具备智能连接、远程监控功能以及健康诊断等功能,帮助您构建智能、安全、生态的配电系统。

In order to meet the intelligent power distribution and the green and low-carbon development, following the rapid development of cloud computing, big data and artificial intelligence, we have launched KFW5 series air circuit breakers at rated current up to 7500A. Such circuit breakers can effectively control the traditional simple power distribution systems and even the sophisticated and complex electrical systems in a simple and efficient way, which are made from green materials to minimize the impact on the environment. The digital circuit breakers can meet your needs for intelligent power distribution in the future. With intelligent connection, remote monitoring and health diagnosis functions, the products can help you build an intelligent, safe and ecological power distribution system.

万能式断路器具有以下特点:
Features of the air circuit breakers:

- 可用手机扫二维码来查询产品身份信息,获取产品资料
You can scan the QR code on your phone to check product identity information and obtain product information
- 内置1级高精度电能测量,电流、电压精度达到0.5%,实现节能增效
Built-in Level 1 high-precision electrical energy measurement at current and voltage accuracy up to 0.5% to achieve energy saving and efficiency
- 全面的电参量测量、电能质量监测、母排温度/环境温湿度监测
Comprehensive electrical parameter measurement, power quality monitoring, busbar temperature/ambient temperature and humidity monitoring
- 提供电流、电压、电能、谐波、频率、温度等全面保护
Full protection for current, voltage, energy, harmonics, frequency, temperature, etc.
- 具有蓝牙/USB/RS485/4G/5G等多种通讯模式,实现便捷组网
Multiple communication modes such as Bluetooth/USB/RS485/4G/5G to facilitate convenient networking
- 内置健康诊断和运维提醒功能,提升运维水平
Built-in health diagnosis and O&M reminder to improve O&M level
- 智能手机便捷的实现移动应用,易于操作和维护
Mobile applications on smartphones to facilitate operation and maintenance
- 通过凯帆云系统和本地监控软件可方便的实现云端和就地管理
KFINE's cloud system and local monitoring software to facilitate cloud and local management



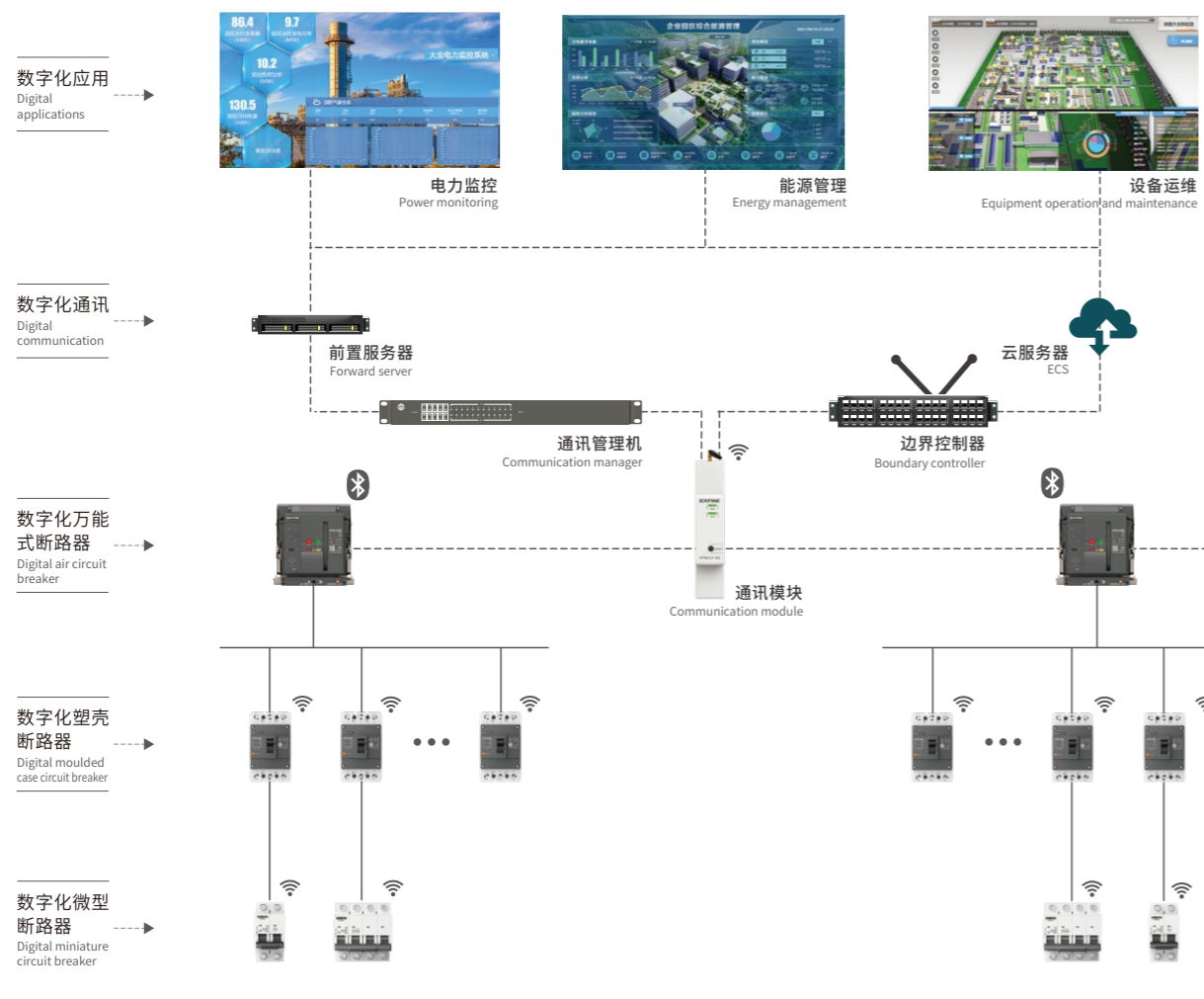
数字化配电系统解决方案

Solutions of digital distribution systems

凯帆开关新一代智能配电系统,致力于为用户提供安全可靠、智能互联,高效便捷的智能化配电产品和解决方案。近年来,凯帆利用物联网、人工智能大数据等先进技术,依托凯帆云系统,以用户为中心,全面开启智能配电业务,以数字化赋能客户实现共赢。

With the new generation of intelligent power distribution systems, KFINE has been committed to providing the users with safe, reliable, efficient and convenient power distribution products and solutions subject to connected intelligence. Using the advanced technologies such as Internet of Things, artificial intelligence and big data and relying on the KFINE cloud system, KFINE has fully provided the intelligent power distribution services for the users as the center to achieve win-win results with digital empowerment for the customers.

- **电力监控:** 低压断路器通过本地通讯实时监视和控制,确保本地系统安全运行。
Power monitoring: The low-voltage circuit breakers are monitored and controlled by local communication in real time to ensure the safe operation of the local system.
- **设备运维:** 提供数字厂牌、设备故障诊断、预测性维护、专家远程指导等服务,提升用户的设备运维能力。
Equipment operation and maintenance: Digital label, equipment fault diagnosis, predictive maintenance, remote expert guidance and other services are provided to improve the capabilities for equipment operation and maintenance.
- **能源管理:** 对多种能源系统进行实时监测,通过多能互补与多源协同控制,实现节能降耗、“双碳”达标。
Energy management: Real-time monitoring of multiple energy systems, multi-energy complement and multi-source collaborative control, to achieve energy saving and consumption reduction and meet the standard for “carbon peaking and carbon neutrality”.



凯帆智控 您的贴身助手

KFINE Intelligent Control, Your Close Assistant

凯帆智控手机APP,通过蓝牙连接,可将断路器控制器的操作转移到移动终端,使用更为便捷,具备保护参数“一键整定”功能,可将断路器保护参数设置成模板,快速下载到控制器,缩短调试周期。

KFINE mobile APP for intelligent control can transfer the operation of the circuit breaker controller to the mobile terminal by means of Bluetooth connection, making it easier to use. It is capable of "one-click setting" function for protection parameters, and can set the protection parameters of circuit breaker as the template for quick download to the controller, in order to shorten the debugging cycle.

主要功能:

Major functions:

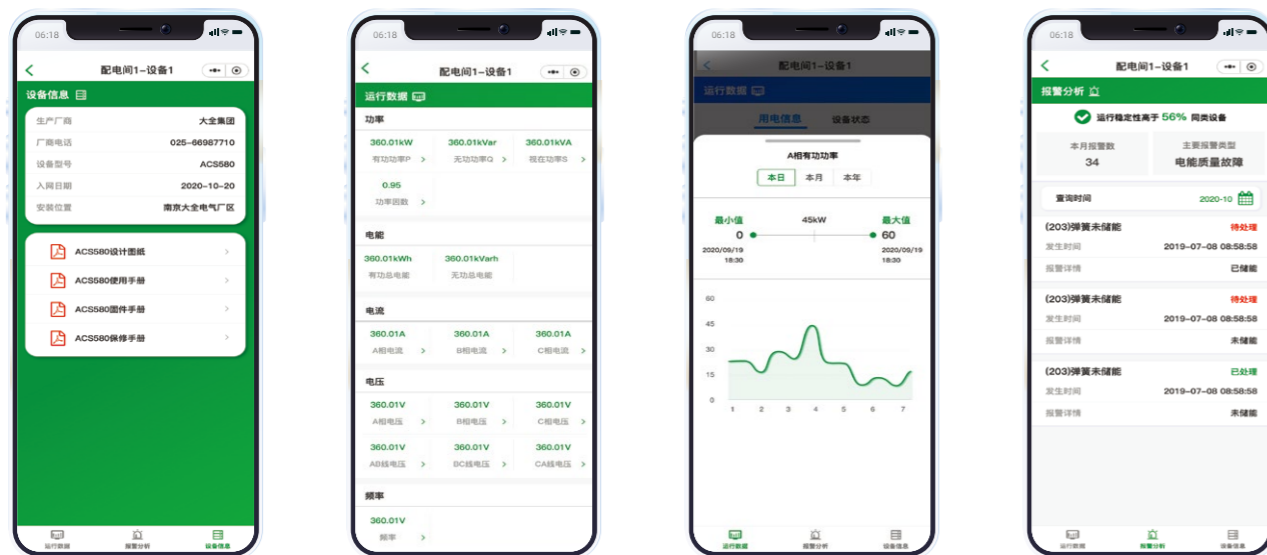
- **查询:** 故障记录、报警记录、操作记录、实时数据
Query: fault record, alarm record, operation record, real-time data
- **调整:** 保护参数、通讯参数
Adjustment: protection parameters, communication parameters
- **操控:** 分闸、合闸
Control: off and on



数字凯帆您的移动管家 Digital KFINE, Your Mobile Manager

数字凯帆是一款针对低压元件的云端应用，依托于大全智慧工业云平台的系统，以微信小程序形式呈现，主要功能有：客户资产管理、运行数据实时监测、历史数据定期查看报警记录永久保存。

Digital KFINE is a cloud application for low-voltage components, relying on DAQO intelligent industrial cloud platform system, presented in the form of WeChat mini-program. Its main functions include: customer asset management, real-time monitoring of operating data, regular viewing of historical data, and permanent storage of alarm records.



设备信息
Communication manager

运行数据
Operation Data

历史数据
Historical data

报警分析
Alarm analysis



KFW5万能式断路器
KFW5 series air circuit breakers

测温单元
Temperature measurement unit

MODBUS模块
MODBUS module

测温模块
Temperature measurement module

4G通讯模块
4G communication module

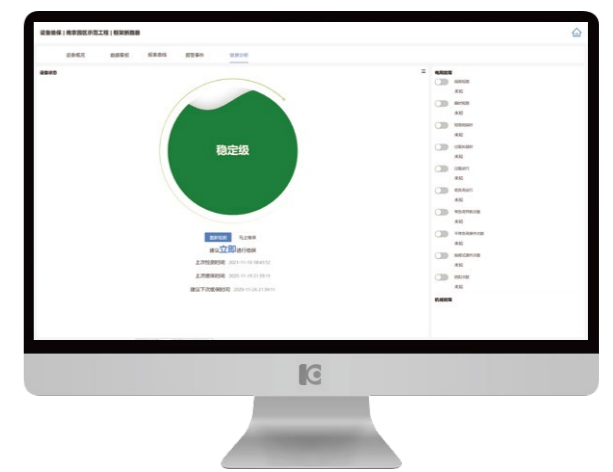
凯帆电气云实现云端管理 KFINE Electric Cloud for Cloud Management

凯帆电气云可提供物联网服务,包括电子地图、在线监测、设备台账、页面组态、故障报警、日志报表、设备无线操控、风险预测等。这些模块化的服务及其组合,可用于电子档案、智能巡检、配电运维、产品升级、能效分析、新能源数据分析、电能质量治理等多种应用场景中。

KFINE Electric Cloud can provide IOT services, including electronic map, online monitoring, equipment account, page configuration, fault alarm, log report, wireless control of equipment, risk prediction, etc. These modular services and their combinations can be used for various application scenarios such as electronic archives, intelligent inspection, distribution operation and maintenance, product upgrades, energy efficiency analysis, new energy data analysis, and power quality governance.



实时监测
Real-time monitoring



寿命评估
Life assessment



能效分析
Energy efficiency analysis



配电运维
Operation and maintenance of power distribution

全地域环境可靠应用

Reliable application in a global environment

配备智能化系统，断路器温度监测，运行状态全面监控；
系统的可靠性验证，支持高原、高温、低温、湿热、盐雾等全地域可靠应用。

Equipped with an intelligent system for circuit breaker temperature monitoring and comprehensive monitoring of operating status;
Reliability verification of the system supports reliable applications in all conditions such as high altitude, high temperature, low temperature, humid heat, salt mist, etc.

- ▶ **存储温度范围** **-40°C~85°C**
Storage temperature range
- ▶ **运行温度范围** **-25°C~70°C**
Operating temperature range

更高性能适用更广

Higher performance and applicability

- KFW5 断路器采用先进的灭弧专利技术，实现更高分断
The KFW5 circuit breaker adopts advanced patented technology for arc extinguishing to provide the higher breaking capacity
- $I_{cs}=I_{cu}=I_{cw}$ ，实现全选择性保护
 $I_{cs}=I_{cu}=I_{cw}$, fully selective protection
- 提供 3s 短时耐受电流，满足特殊行业应用需求。
3s short-term withstand current to meet the requirements for special industry applications.
- 寿命全面提升 保护更长久
Overall life improvement and longer protection
- 高电磁兼容 设计，满足严格的使用环境要求
High electromagnetic compatibility design to meet strict environmental requirements for use

42-50 kA (B, E)

适用于低短路电流的应用场合，
如基础设施和工厂照明等配电场所。
Suitable for applications with low short-circuit current,
Such as infrastructures, factory lighting and other power distribution places.

65-100 kA (N,S,H)

适用于高短路电流的要求场合，如工业生产线、
关键电力设备以及重工业领域等。
Suitable for applications with high short-circuit current, such as industrial
production lines, key power equipment and heavy industries, etc.



135-150 kA (X,V)

适用于极高短路电流的特殊应用场合，如大型发电厂和重工业等
Suitable for the special applications subject to extremely high short-circuit current, such as large power plants and heavy industries, etc.



全面认证 Comprehensive certification

符合的标准 Applicable standards

KFW5断路器及其附件符合以下标准:
KFW5 circuit breaker and its accessories meet the following standards:

IEC/EN 60947-1: 低压开关设备和控制设备第1部分: 总则
IEC/EN 60947-1 Low-voltage Switchgear and Controlgear - Part 1: General Rules

IEC/EN 60947-2: 低压开关设备和控制设备第2部分: 断路器
IEC/EN 60947-2 Low-voltage Switchgear and Controlgear - Part 2: Circuit Breaker

GB 14048.1: 低压开关设备和控制设备第1部分: 总则
GB 14048.1 Low-voltage Switchgear and Controlgear - Part 1: General Rules

GB 14048.2: 低压开关设备和控制设备第2部分: 断路器
GB 14048.2 Low-voltage Switchgear and Controlgear - Part 2: Circuit Breaker

电磁兼容性 Electromagnetic compatibility

KFW5断路器能够避免以下情况的误操作:
The KFW5 circuit breakers can avoid misoperation in any of the following circumstances:

- 开关切换引起的过电压(例如照明回路切换)
Overvoltage due to switching (e.g. lighting circuit switching)
- 大气扰动引起的过电压
Overvoltage due to atmospheric disturbance
- 无线电波发射装置,如:移动电话、收音机、对讲机、雷达等
Radio wave transmitting devices, such as mobile phones, radios, walkie-talkies, radars, etc.
- 用户造成的静电放电
Electrostatic discharge caused by users

KFW5的抗干扰等级符合以下标准:
Anti-interference grade of KFW5 circuit breakers meet the following standards:

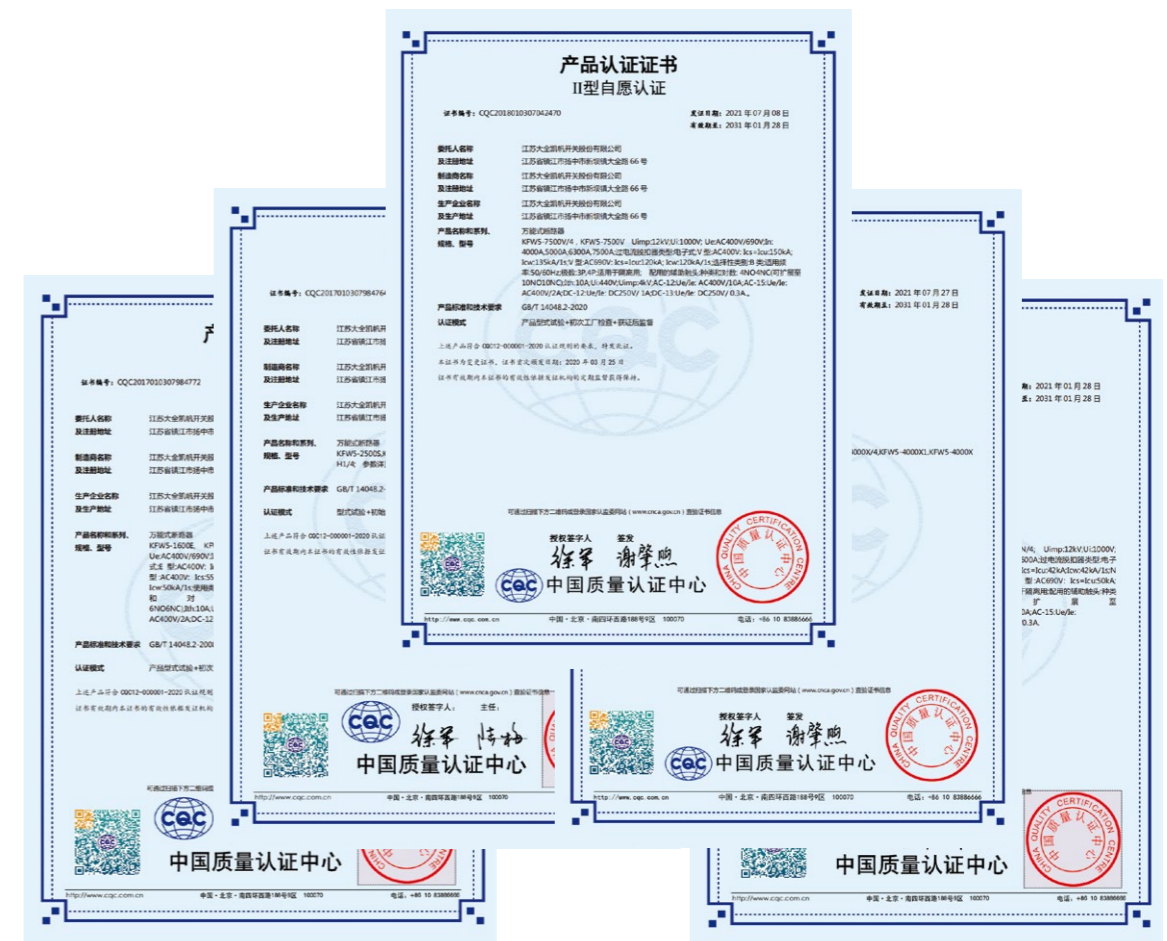
- IEC/EN 60947-2:低压开关设备和控制设备第2部分:断路器
IEC/EN 60947-2 Low-voltage Switchgear and Controlgear - Part 2: Circuit Breaker
- 附录B:具有剩余电流保护的断路器
Appendix B: Circuit Breakers with Residual Current Protection
- 附录F:带电子过电流保护的断路器附加实验
Appendix F: Additional Tests for Circuit Breakers with Electronic Overcurrent Protection
- IEC/EN 61000-4-2:静电放电抗干扰测试
IEC/EN 61000-4-2: Anti-interference Test of Electrostatic Discharge
- IEC/EN 61000-4-3:辐射、无线电、电磁场抗干扰测试
IEC/EN 61000-4-3: Anti-interference Test of Radiation, Radio and Electromagnetic Field
- IEC/EN 61000-4-4:电快速瞬变脉冲群抗干扰性测试
IEC/EN 61000-4-4: Anti-interference Test of Electrical Fast Transient Burst
- IEC/EN 61000-4-5:浪涌抗干扰测试
IEC/EN 61000-4-5: Anti-interference Test of Surge
- IEC/EN 61000-4-6:由无线电磁场感应引起的扰动的抗干扰能力测试
IEC/EN 61000-4-6: Anti-interference Ability Test of Disturbance Due to Radio Magnetic Field Induction
- CISPR 11:工业、科学和医学(ISM)无线电设备电磁抗干扰能力测试
CISPR 11: Electromagnetic Anti-interference Ability Test of Industrial, Scientific and Medical (ISM) Radio Equipment

污染等级 Class of pollution

KFW5断路器可运行于IEC/EN 60947-1和IEC/EN 60664-1标准所定义的3级环境(工业环境)中。
The KFW5 circuit breakers can operate in the Class 3 environment (industrial environment) defined in the IEC/EN 60947-1 and IEC/EN 60664-1.

保护等级 Protection class

KFW5断路器及其附件保护等级符合标准IEC 60529 (IP保护等级)。
The protection class of KFW5 circuit breaker and its accessories conforms to IEC 60529 (IP protection class).



KFW5 产品 PRODUCTS

产品概述 B-1
Product overview

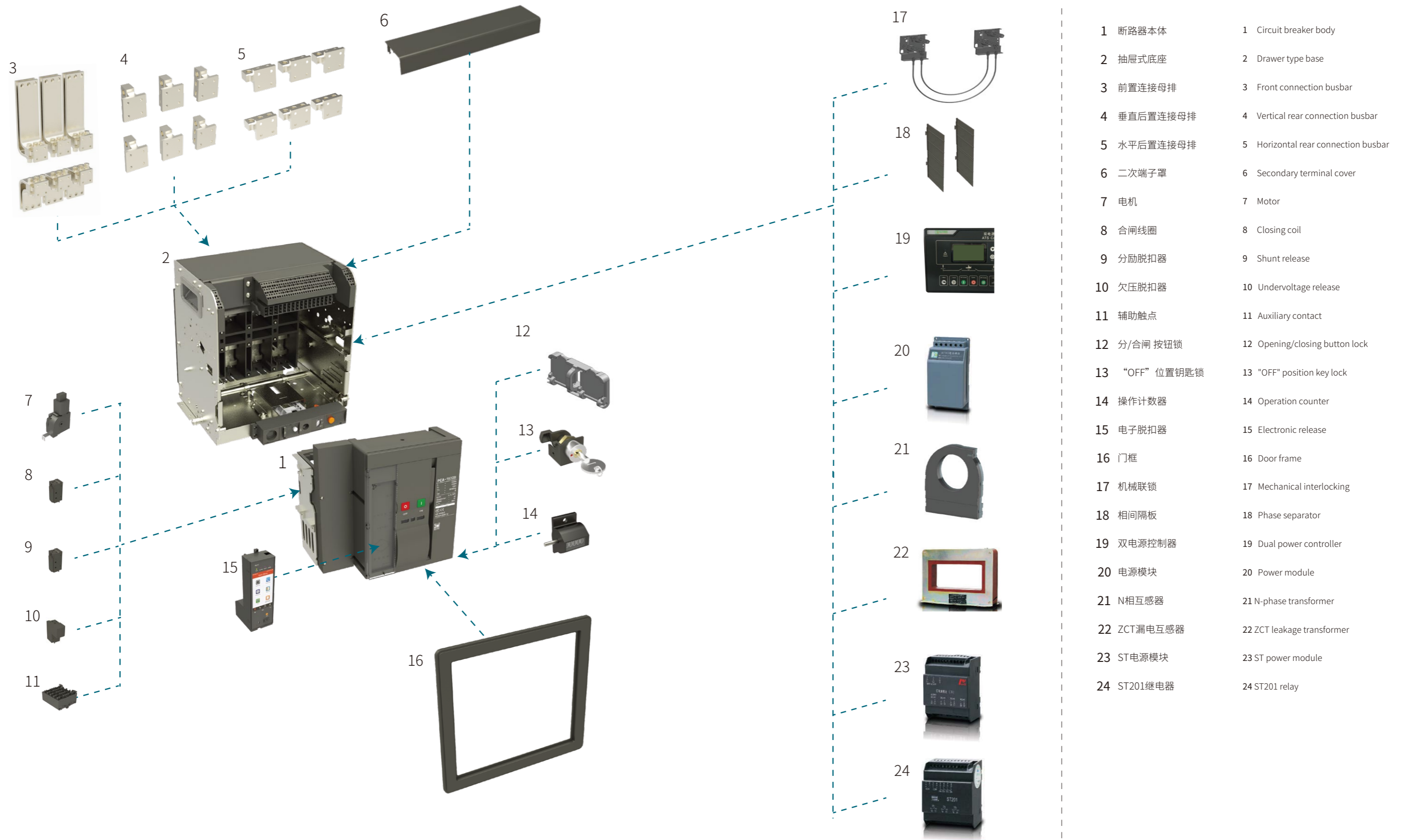
技术参数 B-3
Technical parameters

智能脱扣器 B-5
Intelligent release

数字化功能 B-8
Digital function

部件和附件 B-10
Components and accessories

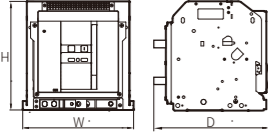




- | | |
|----------------|-------------------------------------|
| 1 断路器本体 | 1 Circuit breaker body |
| 2 抽屉式底座 | 2 Drawer type base |
| 3 前置连接母排 | 3 Front connection busbar |
| 4 垂直后置连接母排 | 4 Vertical rear connection busbar |
| 5 水平后置连接母排 | 5 Horizontal rear connection busbar |
| 6 二次端子罩 | 6 Secondary terminal cover |
| 7 电机 | 7 Motor |
| 8 合闸线圈 | 8 Closing coil |
| 9 分励脱扣器 | 9 Shunt release |
| 10 欠压脱扣器 | 10 Undervoltage release |
| 11 辅助触点 | 11 Auxiliary contact |
| 12 分/合闸 按钮锁 | 12 Opening/closing button lock |
| 13 “OFF” 位置钥匙锁 | 13 "OFF" position key lock |
| 14 操作计数器 | 14 Operation counter |
| 15 电子脱扣器 | 15 Electronic release |
| 16 门框 | 16 Door frame |
| 17 机械联锁 | 17 Mechanical interlocking |
| 18 相间隔板 | 18 Phase separator |
| 19 双电源控制器 | 19 Dual power controller |
| 20 电源模块 | 20 Power module |
| 21 N相互感器 | 21 N-phase transformer |
| 22 ZCT漏电互感器 | 22 ZCT leakage transformer |
| 23 ST电源模块 | 23 ST power module |
| 24 ST201继电器 | 24 ST201 relay |

技术参数
Technical parameters

产品
Products

		KFW5-1600		KFW5-2500			KFW5-4000			KFW5-7500			
壳架电流 Frame current		A	1600	2500			4000			7500			
额定电流 Rated current I_n		A	200/400/630/800/1000/1250/1600	630/800/1000/1250/1600/2000/2500			1000/1250/1600/2000/2500/2900/3200/3600/4000			4000/5000/6300/7500			
极数 Number of poles		P	3/4	3/4			3/4			3/4			
使用类别 Utilization category			B	B			B			B			
符合 IEC/EN60947-2 Comply with IEC/EN60947-2			是 Yes	是 Yes			是 Yes			是 Yes			
隔离功能 Isolating function			是 Yes	是 Yes			是 Yes			是 Yes			
额定工作电压 AC 50/60Hz Rated operating voltage U_e		V	380/400/415/660/690	380/400/415/660/690			380/400/415/660/690			380/400/415/660/690			
额定绝缘电压 Rated insulation voltage U_i		V	1000	1000			1000			1000			
额定冲击耐受电压 Rated impulse withstand voltage U_{imp}		kV	12	12			12			12			
操作时间	合闸时间 Closing time	ms	≤70	≤70			≤70			≤70			
	分断时间 Breaking time	ms	≤30	≤30			≤30			≤30			
分断能力 Breaking capacity			E N	S H H1	H X X1	V							
额定极限短路分断能力 Rated ultimate short-circuit breaking capacity	380/400/415V	I_{cu}	kA	50	70	65	85	100	85	100	126	150	
	660/690V			42	50	50	65	85	65	85	85	120	
额定运行短路分断能力 Rated service short-circuit breaking capacity	380/400/415V	I_{cs}	kA	50	55	65	85	100	85	100	126	150	
	660/690V			42	50	50	65	65	65	85	85	120	
额定短时耐受电流 (1s) Rated short-time withstand current	380/400/415V	I_{cw}	kA/1s	50	55(30/3s)	65	85	85	85	100	105 (65/3s)	135	
	660/690V			42	50	50	65	65	65	85	85	120	
寿命 Service life													
预期机械寿命 Expected mechanical life	不维护 * Without maintenance	次 times	8000		8000			8000			5000		
	维护 With maintenance		10000		10000			10000			10000		
预期电气寿命 Expected electrical life	AC400V	次 times	8000		8000			3000			1500		
	AC690V		3000		3000			2000			1000		
外形尺寸及重量 Overall dimensions and weight													
外形尺寸 Outline dimensions 	固定式 Fixed type	H	mm	330.5		392			392			457	
		W 3P/4P	mm	251.5/321.5		378/473			438/553			814/930	
		D	mm	259		374.5			374.5			550	
	抽屉式 Drawer type	H	mm	352		431			431			503	
		W 3P/4P	mm	286/356		385.5/480.5			445.5/560.5			814/930	
		D	mm	359.5		471.5			471.5			647.5	
重量 (近似值) Weight (approximate)	固定式 Fixed type (3P/4P)	kg	23/30		45/60			50/70			100/130		
	抽屉式 Drawer type (3P/4P)	kg	60/72		90/115			100/120			200/260		

备注：“E”代表“经济型”，“N”代表“普通型”，

* 不维护寿命指电器在修理或更换部件前能完成的操作循环次数的期望值。

Remarks: "E" for "economic type", "N" for "normal type"

“S”代表“标准型”，“H”代表“高分断型”，“H1”代表“较高分断型”，“X”代表“极高分断型”，“V”代表“超高分断型”。

"S" for "standard type", "H" for "high breaking type", "H1" for "higher breaking type", "X" for "extremely high breaking type", and "V" for "super high breaking type"

基本功能	Basic functions
过载保护 (L)	Overload protection
短路短延时保护 (S)	Short delay protection of short circuit
瞬时保护 (I)	Instantaneous protection
接地故障保护 (G)	Ground fault protection
中性线保护 (N)	Neutral line protection
扩展保护功能	Extended protection function
预报警功能	Pre-alarm function
MCR和HSISC保护	MCR and HSISC protection
L, S热记忆功能	L, S thermal memory function
负载控制	Load control
相位不平衡保护	Phase unbalance protection
欠压保护	Undervoltage protection
过压保护	Overvoltage protection
断相保护	Phase failure protection
剩余电流保护	Residual current protection
电流不平衡保护	Current unbalance protection
逆功率保护	Reverse power protection
欠频保护	Underfrequency protection
过频保护	Overfrequency protection
相序保护	Phase sequence protection
谐波保护	Harmonic protection
测量功能	Measurement function
电流	Current
电压	Voltage
功率	Power
功率因数	Power factor
电能	Electric energy
频率	Frequency
谐波	Harmonic
维护功能	Maintenance function
历史峰值	Historical peak
触头当量	Contact equivalent
变位历史记录	Change history
操作次数	Number of operations
报警历史记录	Alarm history
故障记录	Fault record
自检功能	Self-checking function
测试功能	Test function
用户界面	User interface
LED (发光二极管) 指示灯	LED (light emitting diode) indicator
LCD (2) 显示屏	LCD (2) display screen
Mini USB接口	Mini USB interface
通信功能	Communication function
通信模块	Communication module

(1).Itrip A6 具备通讯功能 (2).LCD: 液晶显示器

○ 可选 — 不适合



Itrip A6/4⁽¹⁾



Itrip A3

▲	▲
▲	▲
▲	▲
○	○
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1. 脱扣器名称 1. Name of release
2. LCD显示屏 2. LCD display
3. LED 指示灯 3. LED indicator
4. 操作按键 4. Operation key

特性 Features

- Itrip A4/6配有LCD显示屏, 画质稳定, 且在-20°C~70°C的温度范围内都能够可靠运行。
- Itrip A4/6具有过载保护、短路短延时保护、瞬时短路保护功能以及与工业网络通信的功能, 此外, 还有其他一些扩展功能。
- Itrip A4/6 is fitted with LCD display to provide stable picture quality and can operate reliably in the temperature range of -20°C to 70°C.
- Itrip A4/6 is capable of overload protection, short-circuit short-delay protection, instantaneous short-circuit protection and communication with industrial networks. In addition, it is capable of other extended functions.

供电电源 Power supply

Itrip A4/6正常情况下不需要任何外部电源供电, 可以通过电流互感器来实现自供电。当脱扣单元不能自供电时, 这些模块可以保证脱扣单元仍然可以进行保护功能的设置, 0.4I_n的相电流即可激活这些保护功能。当使用辅助电源时, Itrip A4/6可以在更低的电流情况下工作。Itrip A4/6能够存储并显示脱扣后所有需要的信息, 如脱扣保护类型、脱扣电流、脱扣时间、日期等, 无需外部供电。

Itrip A4/6 does not need any external power supply under normal conditions, which can be self-powered by means of a current transformer. When the trip unit cannot be self-powered, these modules can ensure that the trip unit performs protection function setting. A phase current of 0.4I_n can activate these protection functions. When using an auxiliary power supply, Itrip A4/6 can work at lower current. Itrip A4/6 can store and display all required information after tripping, such as trip protection type, trip current, trip time, date, etc., without external power supply.

用户界面 User interface

用户界面由LCD显示屏、LED指示灯和按键组成。信息显示可设置语言模式, 支持中文和英文。

The user interface comprises an LCD display, LED indicators and buttons. Information display can be set to language mode in Chinese or English.

维护功能 Maintenance function

- | | |
|----------|--------------------------|
| • 操作次数 | • Number of operations |
| • 触头当量 | • Contact equivalent |
| • 历史峰值 | • Historical peak |
| • 报警历史记录 | • Alarm history |
| • 故障记录 | • Fault record |
| • 自检功能 | • Self-checking function |
| • 测试功能 | • Test function |



Itrip A3

- | | |
|------------|--------------------|
| 1. 脱扣器名称 | 1. Name of release |
| 2. LED 指示灯 | 2. LED indicator |
| 3. LCD显示屏 | 3. LCD display |
| 4. 操作按键 | 4. Operation key |

特性 Features

ItripA3 可以实现最常用的保护功能, 包括过载保护功能, 长延时保护, 短路短路延时保护, 瞬时保护、中性线保护和接地故障保护。保护电流 ItripA3 的阈值和延迟时间都由旋钮按键设置。

ItripA3 can perform the most commonly used protection functions, including overload protection, long delay protection, short-circuit delay protection, instantaneous protection, neutral line protection and ground fault protection. The threshold and delay time of the protection current ItripA3 are set by the knob.

供电电源 Power supply

ItripA3 正常情况下不需要任何外部电源供电, 可以通过电流互感器来实现自供电。当脱扣单元不能自供电时, 这些模块可以保证脱扣单元仍然可以进行保护功能的设置, 0.4I_n的相电流即可激活这些保护功能。

ItripA3 does not need any external power supply under normal conditions, which can be self-powered by means of a current transformer. When the trip unit cannot be self-powered, these modules can ensure that the trip unit performs protection function setting. A phase current of 0.4I_n can activate these protection functions.

用户界面 User interface

用户界面由LCD显示屏、LED指示灯和按键组成。信息显示可设置语言模式, 支持中文和英文。

The user interface comprises an LCD display, LED indicators and buttons. Information display can be set to language mode in Chinese or English.

维护功能 Maintenance function

● 测试功能 Test function

ETU前面板上的“TEST”信号灯可以显示一系列测试功能, 包括对微处理器、脱扣线圈和断路器脱扣机构的检测, 保证运行的正确性。

The “TEST” signal light on the front panel of the ETU can displays a series of test functions, including the detection of the microprocessor, trip coil and circuit breaker tripping mechanism to ensure the correctness of operation.

概述 Introduction

KFW5系列断路器提供多种系统功能, 包括无线智控、设备运维、电力监控等, 方便实现数据本地查看及远程管理, 构建智能、安全的配电系统。KFW5 series circuit breakers can provide a variety of system functions, including wireless intelligent control, equipment operation and maintenance, power monitoring, etc., to facilitate local data viewing and remote management, and build an intelligent and safe power distribution system.

- 通过加装蓝牙 /USB 模块, 实现与智能手机、PC 的本地互联。
With Bluetooth/USB modules, the circuit breakers can be locally connected with smartphones and PCs.
- 通过加装多协议通信模块, 实现远程互联。
With a multi-protocol communication module, the circuit breakers can be remotely connected.
- 通过加装 WiFi 通信模块, 实现无线互联。
With a WiFi communication module, the circuit breakers can be connected in a wireless mode.
- 通过加装边界控制器, 实现云端互联。
With boundary controllers, the circuit breakers can be connected at the cloud.



无线智控 Wireless intelligent control

KFW5系列断路器提供WiFi无线组网方式, 通过凯帆智控实现云管理, 在远端即可对配电系统进行监测;提供蓝牙通讯, 通过手机蓝牙连接凯帆智控实现本地管理, 当系统发生故障时, 断路器会及时将相关故障信息上传至云端并通知用户。

KFW5 series circuit breakers provide a WIFI wireless networking mode and perform cloud management by means of KFINE intelligent control to monitor the distribution system at the remote end; by means of Bluetooth communication, the mobile phone Bluetooth is connected to KFINE intelligent control for local management. In case of system failures, the circuit breakers will timely upload the fault information to the cloud and notify the users.

- 对断路器的状态、性能进行实时监测, 加快事故处理进程。
Real-time monitoring of the status and performance of circuit breakers to accelerate accident handling.
- 自动化部署: 借助云服务器进行管理, 真正实现设备的即插即用、全网的统一设置。
Automated deployment: The plug and play of equipment and the unified setting of the entire network can be realized with the help of cloud servers for management.
- 自动优化: 云服务器管理端利用 AI 及大数据对收集到的数据进行实时分析, 并自动生成优化策略传送到客户。
Automatic optimization: The cloud server management analyzes the collected data in real time by using AI and big data, automatically generates optimization strategies and transmits them to the customers.
- 自动故障预测和处理: 基于历史和实时数据, 进行设备异常预测, 将设备潜在故障提前消灭在萌芽中。
Automatic fault prediction and processing: Based on historical and real-time data, equipment failure prediction is carried out to eliminate potential equipment faults in advance.



凯帆智控
KFINE Intelligent Control

数字凯帆
Digital KFINE

设备运维 Equipment operation and maintenance

KFW5系列断路器可以通过通讯网关连接凯帆电气云端，深度融合“云、大、物、移、智”等前沿技术,提供一系列设备的智能化运维全方位提高电气设备运维的深度和广度。

The KFW5 series circuit breakers can be connected to the KFINE Electric Cloud through communication gateways and deeply integrated with cutting-edge technologies such as "cloud, big, physical, mobile, and intelligent", and provide intelligent operation and maintenance of equipment to comprehensively improve the operation and maintenance of electrical equipment.

- (数字)牌: 提供项目资料、技术手册、运维指导, 联系方式、新品介绍等信息。
(Digital) label: It provides project information, technical manuals, operation and maintenance guidance, contact information, new product introduction and other information.
- 设备故障诊断: 可进行数字采集、状态监视, 发现问题及时报警, 提醒并指导运维人员进行检修及故障处理。
Equipment fault diagnosis: It can perform digital acquisition and status monitoring, give a timely alarm when identifying a problem, remind and guide the operation and maintenance personnel to carry out maintenance and fault handling.
- 预测性维护: 根据设备状态预测计算, 针对性给出检修建议, 做到提前预测风险。
Predictive maintenance: According to the prediction and calculation of equipment status, provide targeted maintenance suggestions to predict risks in advance.
- 专家远程指导: 用户可借助 AR 眼镜, 查看现场设备的运行状态, 接受厂商专家提供的远程维护指导服务
Remote expert guidance: The users can check the operation status of on-site equipment using AR glasses and receive remote maintenance guidance services provided by manufacturer experts



电力监控 Electric power monitoring

KFW5系列断路器提供了多样化的现场总线接入方式, 可实现“遥控、遥信、遥调、遥测”四遥功能, 支持的通信协议有Modbus RTU、Profibus-DP、DeviceNet、Modbus TCP等。

The KFW5 series circuit breakers provide a variety of fieldbus access methods to perform the four remote functions of "remote control, remote signaling, remote regulation, and telemetry" and support the communication protocols such as Modbus RTU, Profibus-DP, DeviceNet, Modbus TCP, etc.

- 遥控: 远程分合断路器。
Remote control: Remote opening and closing of circuit breakers.
- 遥信: 健康诊断记录、脱扣 / 报警记录、操作记录、运行记录、历史最大 / 最小值等断路器状态数据
Remote signaling: Health diagnosis records, trip/alarm records, operation records, operation records, historical maximum/minimum values and other circuit breaker status data
- 遥调: 远程对保护功能及智能配电控制参数读取和修改。
Remote regulation: Remote reading and modification of protection functions and intelligent distribution control parameters.
- 遥测: 实时电流、电压、功率、电能、功率因数、频率、需量值、电能质量分析等。
Telemetry: Real-time current, voltage, power, energy, power factor, frequency, demand value, power quality analysis, etc.



辅助触点 (AUX) Auxiliary contact

辅助触点不仅能够指示断路器分合闸的状态, 还可以控制辅助回路中的指示灯和继电器。KFW5 断路器提供标准的 4NO/NC 触点, 其中 KFW5-2500~KFW5-7500可扩展至 10NO/NC。

The auxiliary contact can not only indicate the opening and closing status of the circuit breaker, but also control the indicators and relays in the auxiliary circuit. KFW5 circuit breakers provide standard 4NO/NC contacts, among which KFW5-2500~KFW5-7500 can be expanded to 10NO/NC.



辅助触点
Auxiliary contact

电气特性 Electrical Properties	类别 Category	DC(V)	AC(V)
额定控制电源电压 (U _c) Rated control power voltage	[V]	250	380
分断能力 Breaking capacity	[A]	AC-12	16A
		DC-12	5A

合闸准备就绪指示触点 (PF) Closing ready indicating contact

用于指示断路器是否已合闸准备就绪。以下条件同时满足时此触点会变更状态:
Used to indicate whether the circuit breaker is ready to be closed. This contact will change state when meeting all the following conditions:

- 断路器已分闸
- 主弹簧已储能
- 无分闸命令 (欠压脱扣器已上电, ETU已复位)
- The circuit breaker has been opened
- The main spring has been charged
- No opening command (the undervoltage release has been powered on and the ETU has been reset)

储能信号指示触点 (SQ) Energy storage signal indicating contact

储能信号指示触点用于指示主弹簧是否已经储能。此部件与电机一起提供。
The energy storage signal indicating contact is used to indicate whether the main spring has been charged. This components is supplied with the motor.

故障脱扣信号指示触点 (FT1) Fault trip signal indicating contact

故障脱扣信号指示触点用于指示ETU是否脱扣。此部件与断路器一起提供。
Fault trip signal indicating contact is used to indicate whether the ETU is tripped. This component is supplied with the circuit breaker.



抽屉座位置指示触点
Drawer base position indicating contact

■ 抽屉座位置指示触点 (PI) Drawer base position indicating contact

对于抽屉式断路器，可以通过装配在抽屉座内的电气指示触点来指示本体的“连接、测试、断开”位置。

For withdrawable circuit breakers, the electrical indicating contacts installed in the drawerbase can indicate the “Connect, Test, Disconnect” position of the body.

PF、SQ、FT1和PI参数表 Parameter table

电气特性 Electrical Properties	类别 Category	DC(V)	AC(V)
额定控制电源电压 (Us) Rated control power voltage	[V]	24 48 110~130 200~250	24~250
分断能力 Breaking capacity	[A]	AC~12 DC~12	5 -
		3 3 0.4 0.2	-



欠压脱扣器
Undervoltage release

■ 欠压脱扣器 (UVR) Undervoltage release

当系统断电或电压降至 $0.7 \times U_n$ 以下时，欠压脱扣器可将断路器分断。当电压恢复到 0.85 至 $1.1 \times U_n$ 时，断路器可重新闭合。当控制电压低于 $35\% U_n$ 时，断路器不能合闸。此脱扣器可由供电侧供电或由单独的电源供电。

When the system is powered off or the voltage drops below $0.7 \times U_n$, the undervoltage release can disconnect the circuit breaker. When the voltage recovers to 0.85 to $1.1 \times U_n$, the circuit breaker can be closed again. When the control voltage is lower than $35\% U_n$, the circuit breaker cannot be closed. The release can be powered by the power supply side or by a separate power supply.

电气特性 (UVR) Electrical Properties

额定控制电源电压 (Us) Rated control power voltage	[V]	DC: 110~130 200~250 AC: 110~130 200~250 380~440
工作条件 Working conditions		符合 GB/T 14048.2 及 IEC 60947-2 动作 $(0.35 \sim 0.7) U_n$
工作电压 Working voltage		可靠合闸 $(0.85 \sim 1.1) U_n$ 可靠不能合闸 $\leq 0.35 U_n$
冲击功率 Impact power	[W/VA]	≤ 200
额定功率 Rated power	[W/VA]	≤ 5
分闸时间 Opening time	[ms]	≤ 50
工作类型 Type of work		连续工作



分励脱扣器
Shunt release



■ 分励脱扣器 (SR) 和合闸线圈 (CC) Shunt release and closing coil

当供电电压为额定供电电压 U_n 的 70% 到 110% 之间时，分励脱扣器可以远程断开断路器。当断路器处于合闸状态时，AC 或 DC 的电压都可控制分励脱扣器同时对断路器进行分闸。KFW5 断路器可同时装配两个分励脱扣器，以确保高分断安全性。当同时使用两个分励脱扣器时无法装配欠压脱扣器。

当断路器处于分闸状态时，只有当储能弹簧储能后，合闸线圈才可以对断路器进行合闸。

When the supply voltage is between 70% and 110% of the rated supply voltage U_n , the shunt release can remotely disconnect the circuit breaker. When the circuit breaker is in the closed state, the AC or DC voltage can control the shunt release to open the circuit breaker at any time. KFW5 circuit breaker can be equipped with two shunt releases at the same time to ensure high breaking safety. When using two shunt releases at the same time, the undervoltage release cannot be assembled.

When the circuit breaker is in the open state, the closing coil can turn on the circuit breaker only after the energy storage spring is charged.

电气特性 (SR 和 CC) Electrical properties

额定控制电源电压 (Us) Rated control power Voltage	[V]	DC: 110~130 200~250 AC: 110~130 200~250 380~440
工作条件 Working conditions		符合 GB/T 14048.2 及 IEC/EN 60947-2
工作电压 Working voltage		分励: $0.7 \sim 1.1 U_n$ 闭合: $0.85 \sim 1.1 U_n$
冲击功率 Impact power	[W/VA]	≤ 200
额定功率 Rated power	[W/VA]	≤ 5
动作时间 Action time	[ms]	≤ 50
工作类型 Type of work		短时工作



合闸线圈
Closing coil



■ 远程复位单元 Remote reset unit

远程复位单元可以在过流故障脱扣后对 ETU 进行复位操作。

The remote reset unit can reset the ETU after overcurrent fault tripping.

电气特性 Electrical Properties

额定控制电源电压 (Us) Rated control power voltage	[V]	AC: 200~250
动作电压 Operating voltage		$0.85 \sim 1.1 U_n$



电机
Motor

电机 (M) Motor

电机可以自动对断路器的储能弹簧进行储能。当储能弹簧释能，电机自动储能，保证断路器可及时合闸。当电机失电时，合闸弹簧可通过断路器上的手柄进行手动储能。电机配有限位开关触点来显示弹簧的状态。

The motor can automatically charge the energy storage spring of the circuit breaker. When the energy storage spring is discharged, the motor will automatically store energy, to ensure that the circuit breaker can be closed in a timely manner. When the motor loses power, the closing spring can be operated for charging by the handle on the circuit breaker. The motor is equipped with limit switch contacts to display the state of the spring.

电气特性 Electrical properties

额定控制电源电压 (U _s) Rated control power voltage	[V]	DC: 110~130 200~250 AC: 110~130 200~250 380~440
工作电压 Working conditions		0.85~1.1 U _n
工作周期 Working voltage		最大每分钟 3 个循环 Maximum 3 cycles per minute
冲击时间 Impact power	[s]	≤0.2
加载时间 Rated power	[s]	≤5
冲击功率 Action time	[W/VA]	≤500
额定功率 Type of work	[W/VA]	≤200

失配保护 Mismatch protection

抽屉式断路器保证断路器只能插入相应的抽屉座中。

The withdrawable circuit breaker ensures that the circuit breaker can only be inserted into the corresponding drawer base.

OFF位置钥匙锁 OFF position key lock

KFW5断路器可以在分闸位置被锁定，防止合闸误操作。“OFF”位置钥匙锁可以有以下三种形式：

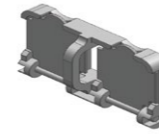
- 一台断路器一副锁配一把钥匙；
- 两台断路器两副锁共用一把钥匙；
- 三台断路器三副锁使用两把钥匙。

KFW5 circuit breaker can be locked in the opening position to prevent misoperation of closing. The OFF position key lock can take the following three forms:

- One circuit breaker adopts one lock fitted with one key;
- Two circuit breakers adopt two locks sharing one key;
- Three circuit breakers adopt three locks sharing two keys.



OFF位置钥匙锁
OFF position key lock



分/合闸按钮锁
Opening/closing button lock

分/合闸按钮锁 Opening/closing button lock

分/合闸按钮锁可以防止断路器非法分合闸。此按钮锁最多可同时使用三把挂锁。挂锁 (Φ3~Φ6) 需用户自备。

The opening/closing button lock can prevent illegal opening and closing of the circuit breaker. This button lock can use up to three padlocks at the same time. The padlocks (Φ3~Φ6) need to be prepared by the user.



操作计数器
Operation counter

操作计数器 Operation counter

操作计数器用于帮助客户决定断路器维护时机，位于断路器前面板，用户可以方便地看出断路器的操作次数。

The operation counter is used to help the customers decide the maintenance time of circuit breaker. It is arranged on the front panel of the circuit breaker to easily see the number of operations of the circuit breaker by the user.

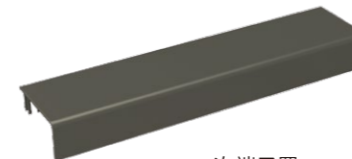


相间隔板
Phase separator

相间隔板 Phase separator

相间隔板用于增加邻相间的绝缘特性。在500V以上电压时，壳架1600A的断路器必须装配相间隔板。

The phase separator is used to increase the insulation characteristics between adjacent phases. When the voltage is above 500V, the circuit breaker with a 1600A frame must be equipped with a phase separator.



二次端子罩
Secondary terminal cover

二次端子罩 Secondary terminal cover

二次端子罩装配于壳架的二次端子区域，用于降低直接接触二次回路中带电部件的风险。

The secondary terminal cover is assembled in the secondary terminal area of the frame to reduce the risk of direct contact with live parts in the secondary circuit.

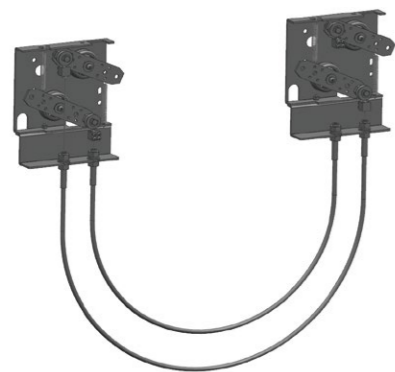


门框
Door frame

门框 Door frame

门框安装于开关设备的门板上，使防护等级达到IP40。

The door frame is installed on the door panel of the switchgear to reach the protection level of IP40.



机械联锁
Mechanical interlocking



机械连锁
Mechanical interlocking

机械联锁 Mechanical interlocking

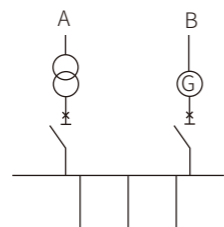
机械联锁为两个或三个断路器之间的分合闸提供几种联锁方式，可实现水平联锁和垂直接锁。

The mechanical interlocking provides several interlocking methods for opening and closing of two or three circuit breakers to realize horizontal interlocking and vertical interlocking.

四种可能的机械联锁方式：
Four possible mechanical interlocking methods:

1. 2个断路器之间（常用电源+备用紧急电源）

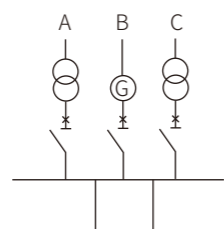
1. Mechanical interlocking between 2 circuit breakers (common power supply + standby emergency power supply)



A	B
0	0
0	1
1	0

2. 3个断路器之间（2个常用电源+备用紧急电源）

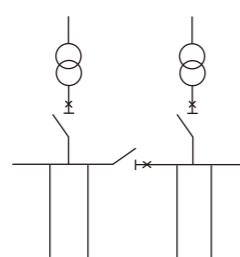
2. Mechanical interlocking among 3 circuit breakers (2 common power supplies + standby emergency power supply)



A	B	C
0	0	0
0	0	1
1	0	0
1	0	1
0	1	0

3. 3个断路器之间（2个常用电源和母排）

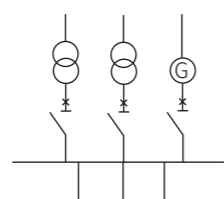
3. Mechanical interlocking among 3 circuit breakers (2 common power supplies + standby emergency power supply)



A	B	C
0	0	0
0	0	1
0	1	0
1	0	0
1	0	1
1	1	0
0	1	1

4. 3个断路器之间（3个供电电源共用同一母排，但不可并联运作）

4. Mechanical interlocking between 3 circuit breakers (3 power supplies share the same busbar, but can not operate in parallel)



A	B	C
0	0	0
0	0	1
1	0	0
0	1	0



双电源控制器 Dual power controller

双电源自动转换系统可以实现两路电源之间的转换供电，确保用户用电可靠性，双电源自动转换系统在选择双电源自动控制器时，必需选配机械联锁和PF触点配合使用。

The dual-power automatic conversion system can realize the conversion between the two power supplies to ensure the reliability of the user's power utilization. When the dual-power automatic conversion system is equipped with a dual-power automatic controller, the mechanical interlocking must be used with PF contact.



电源模块 Power module

KFW5电源模块可输入电压AC220V/DC220V/DC10V，输出DC24V电源提供给控制单元。

KFW5 power module can have the input voltage AC220V/DC220V/DC10V and output DC24V power to the control unit.



N相互感器 N-phase transformer

接地保护方式为3P+N时，选用N相互感器。在3相4线系统中用3极断路器时，中性极电流互感器做接地故障保护用，并应与智能脱扣器一起使用。

When the grounding protection mode is 3P+N, the N-phase transformer shall be used. When a 3-pole circuit breaker is used in the three-phase four-wire system, the neutral current transformer can be used for ground fault protection and shall be used together with an intelligent release.



ZCT漏电互感器 ZCT leakage transformer

接地保护方式为漏电保护时，选用漏电互感器。与智能脱扣器组合使用时，漏电互感器是用来检测几个安培的接地漏电流。

When the grounding protection mode is the leakage protection, a leakage transformer shall be selected. When used in combination with an intelligent release, the leakage transformer will be used to detect ground leakage current of several amperes.



ST电源模块 ST power module

ST电源模块IV可提供功率不小于9.6W的直流24V电源，可输出四组接线端子，输入分：AC440V，AC230V和DC110/200V。可用作ST201继电器模块或直流控制器的电源。

ST power module IV can provide a DC 24V power supply with a power of not less than 9.6W, and can output four sets of terminal blocks. The input is AC440V, AC230V and DC110/200V. The power module can be used as the power supply of ST201 relay module or DC controller.



ST201继电器 ST201 relay

控制器输出的信号用于控制断路器分/合闸或带负载容量较大时，需通过ST201继电器模块转换后进行控制。ST201触点容量为交流：AC250V，10A和直流：DC28V，10A。

The signal output by the controller is used to control the opening/closing of the circuit breaker. When the load capacity is relatively large, the opening/closing shall be controlled after conversion by ST201 relay module. The ST201 contact capacity is AC250V, 10A and DC28V, 10A.

KFW5

尺寸与安装

DIMENSIONS AND INSTALLATION

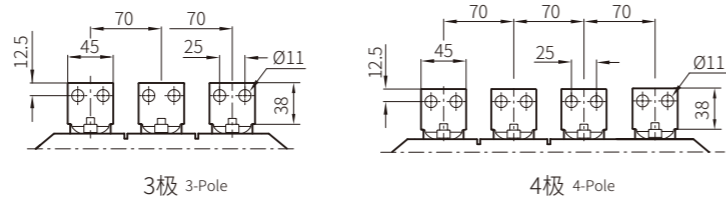
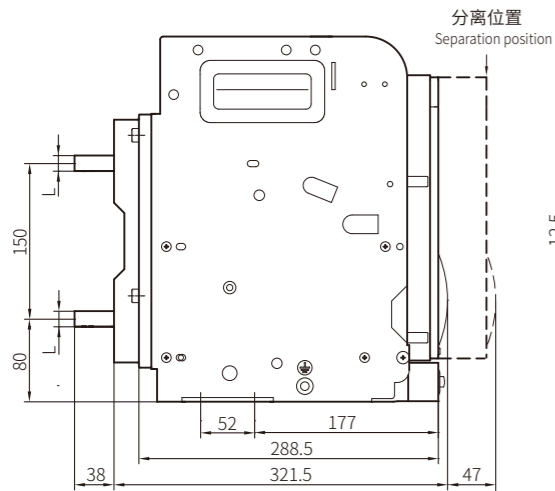
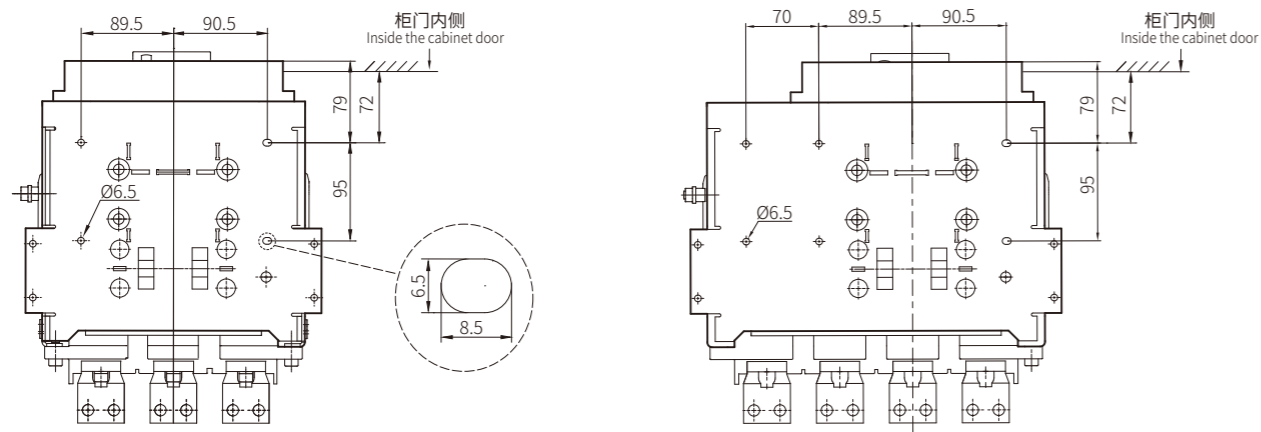
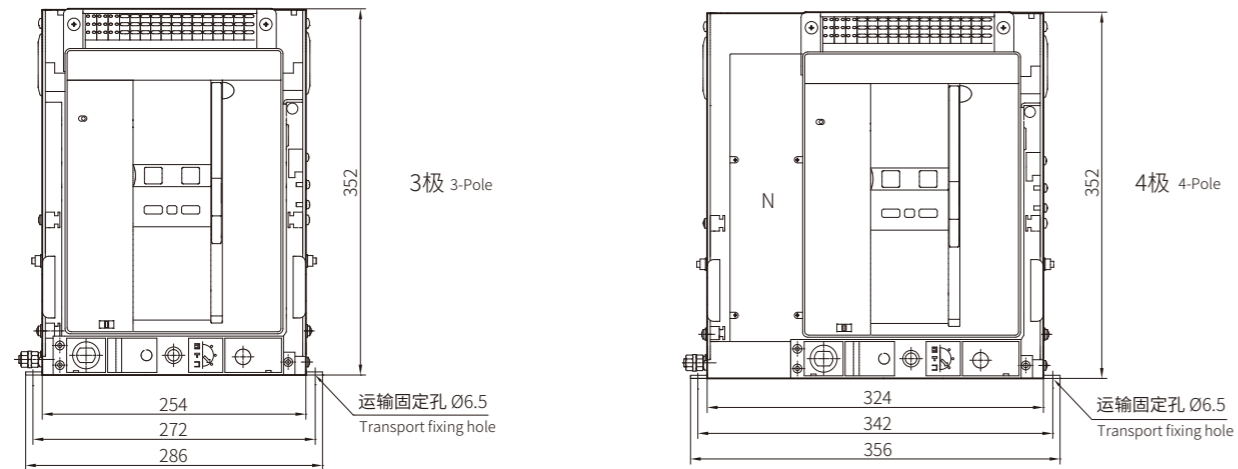
KFW5-1600	C-1
KFW5-2500	C-5
KFW5-4000	C-9
KFW5-7500	C-13
附件尺寸 Accessory dimensions	C-21
外形尺寸 Overall dimensions	C-23
安装 Installation	C-24

KFW5-1600 抽屉式断路器

KFW5-1600 withdrawable type circuit breaker

安装尺寸 Dimensions installation

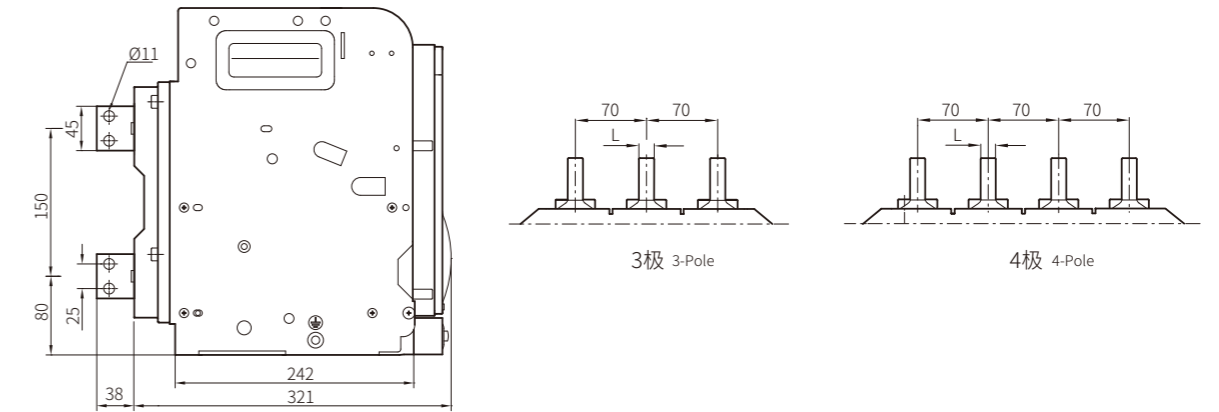
抽屉式断路器 水平后连接 Withdrawable type circuit breaker Horizontal back connection



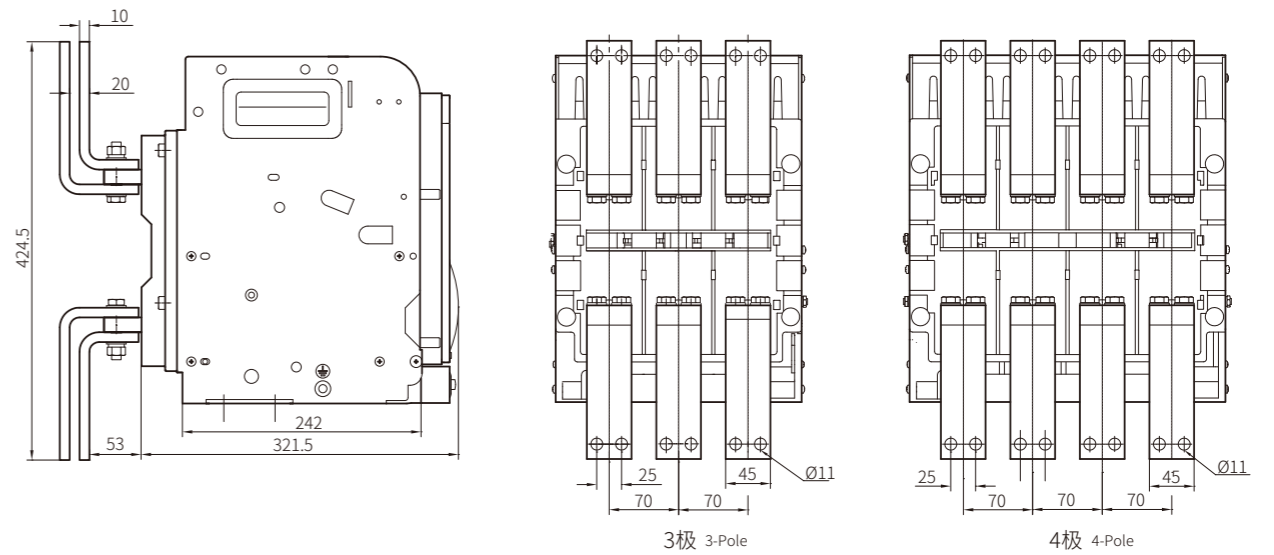
额定电流等级 Rated current level	母排厚度值L Busbar thickness value
In=200-1250A	10mm
In=1600A	15mm

备注：尺寸单位为mm Remarks: The dimensions unit is mm

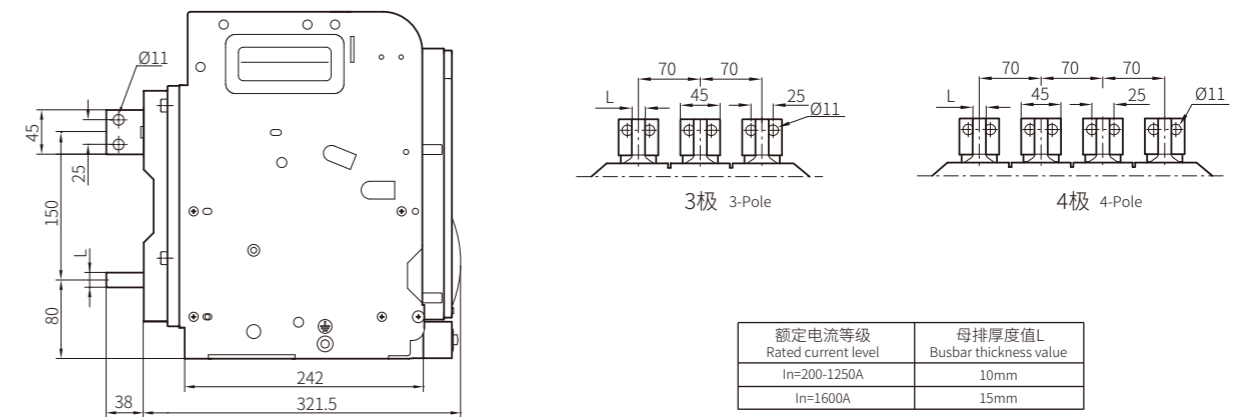
抽屉式断路器 垂直后连接 Withdrawable type circuit breaker Vertical back connection



抽屉式断路器 前连接 Withdrawable type circuit breaker Front connection



抽屉式断路器 混合后连接 Withdrawable type circuit breaker Mixed back connection



额定电流等级 Rated current level	母排厚度值L Busbar thickness value
In=200-1250A	10mm
In=1600A	15mm

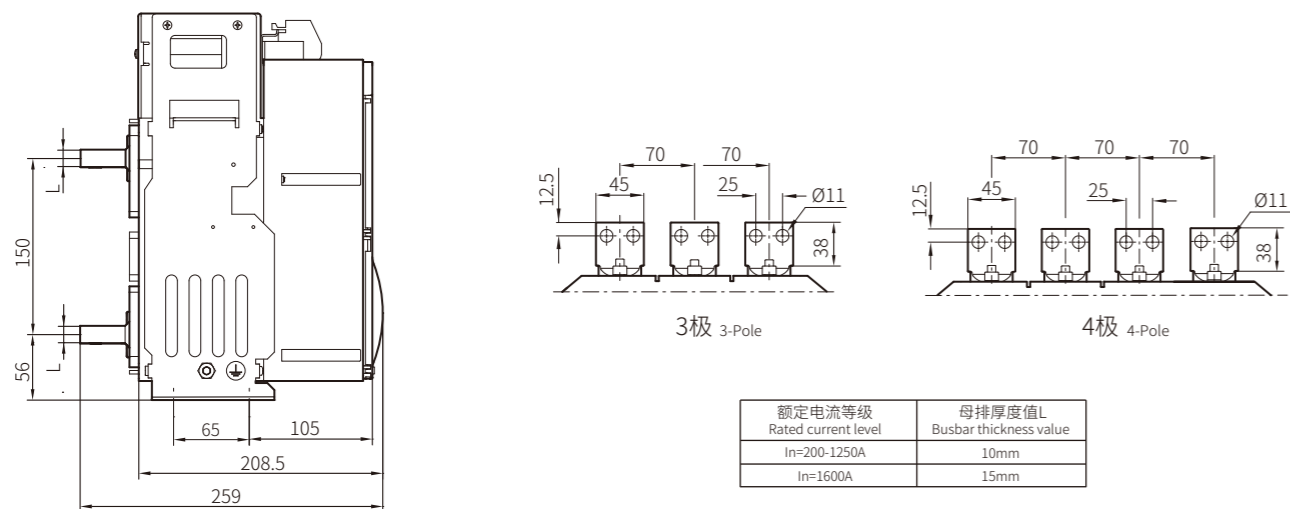
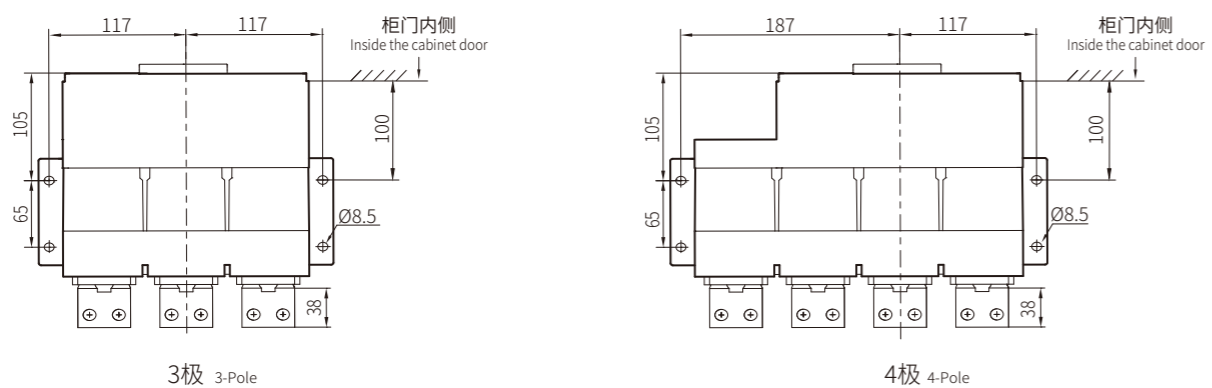
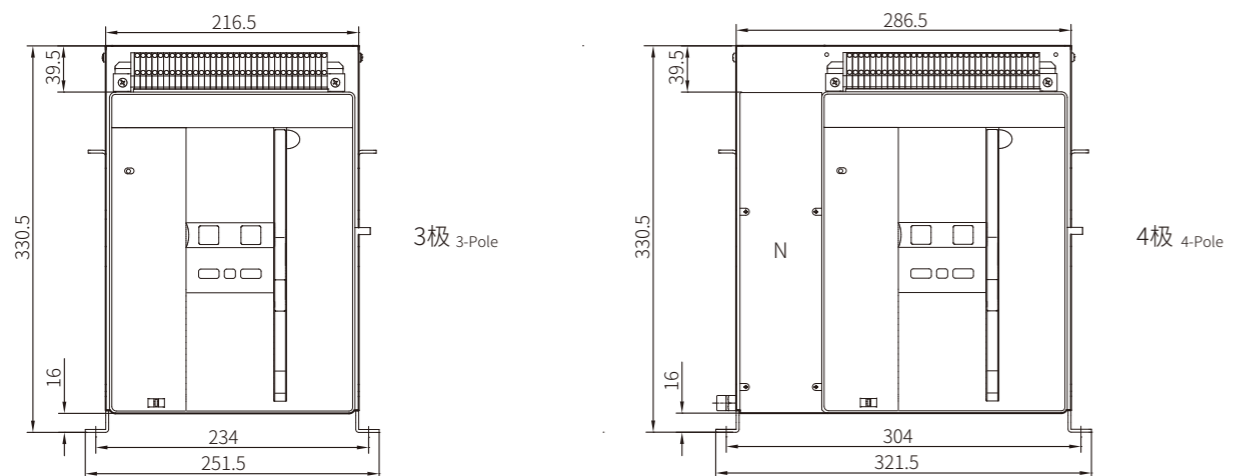
备注：尺寸单位为mm Remarks: The dimensions unit is mm

KFW5-1600 固定式断路器

KFW5-1600 fixed type circuit breaker

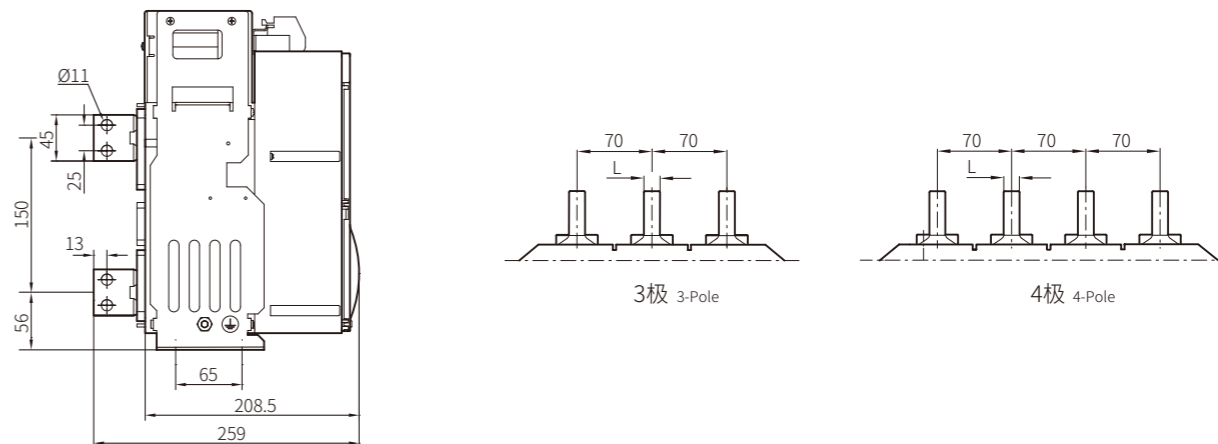
安装尺寸 Dimensions installation

固定式断路器 水平后连接 Fixed type circuit breaker Horizontal back connection

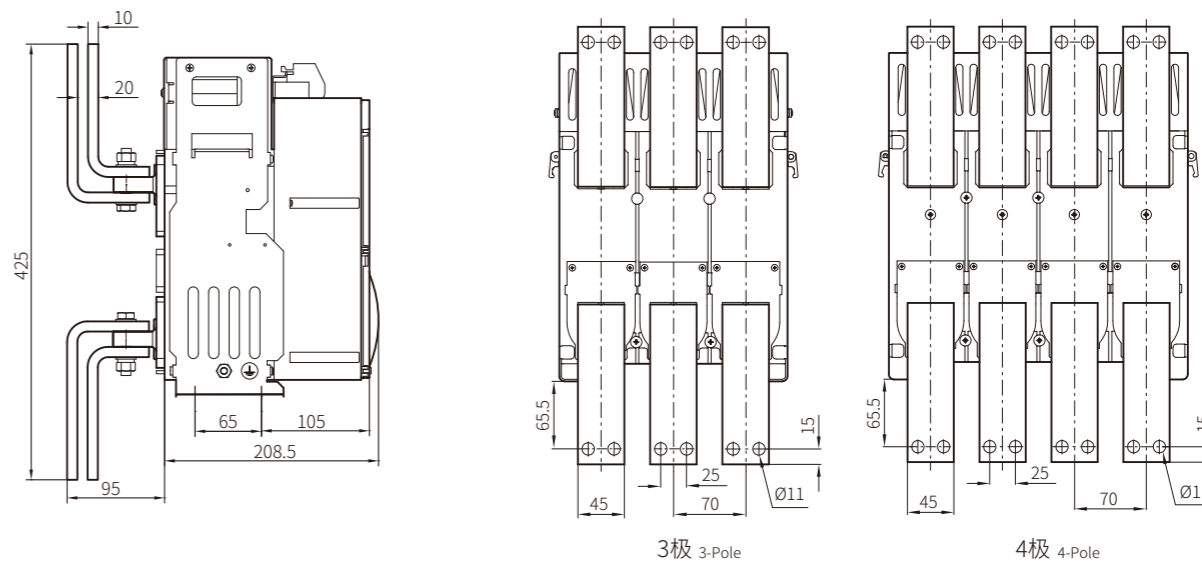


备注：尺寸单位为mm Remarks: The dimensions unit is mm

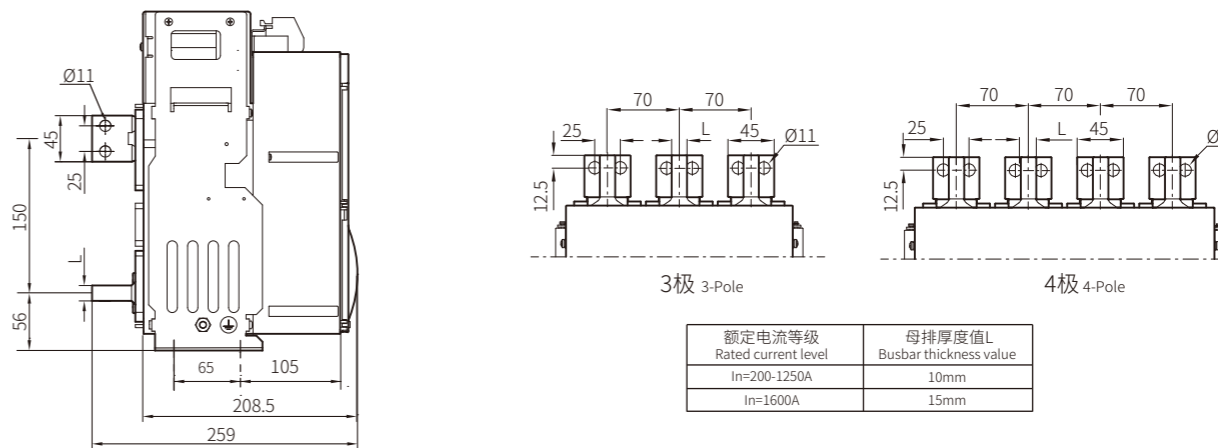
固定式断路器 垂直后连接 Fixed type circuit breaker Vertical back connection



固定式断路器 前连接 Fixed type circuit breaker Front connection



固定式断路器 混合后连接 Fixed type circuit breaker Mixed back connection



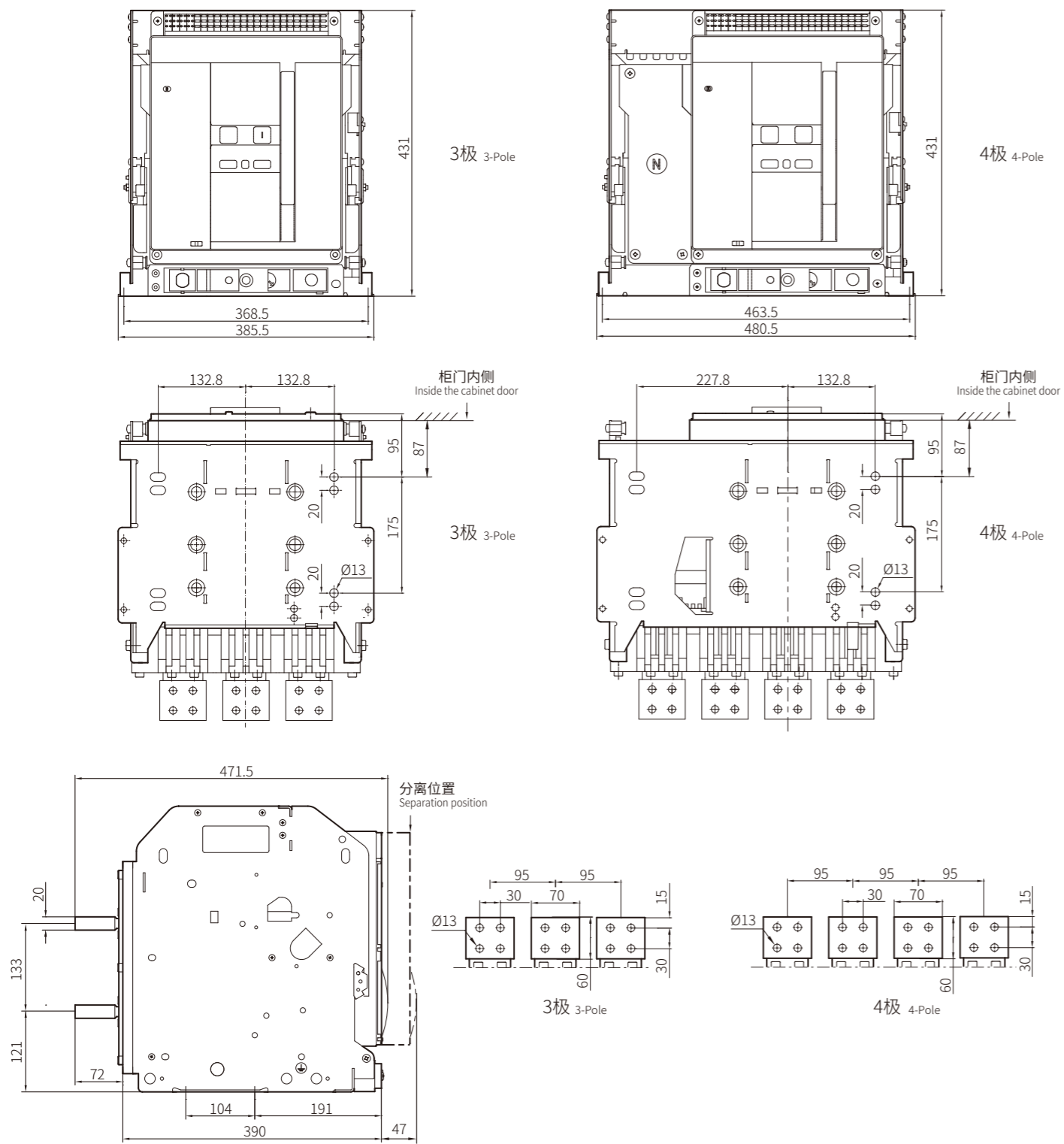
备注：尺寸单位为mm Remarks: The dimensions unit is mm

KFW5-2500 抽屉式断路器

KFW5-2500 withdrawable type circuit breaker

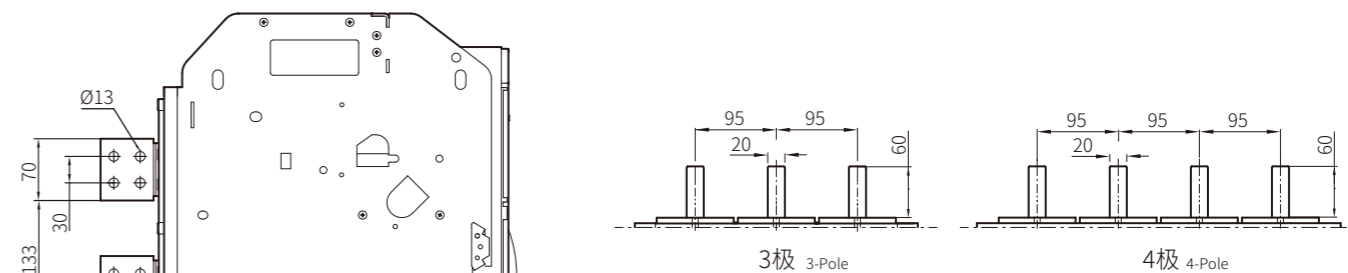
安装尺寸 Dimensions installation

抽屉式断路器 水平后连接 Withdrawable type circuit breaker Horizontal back connection

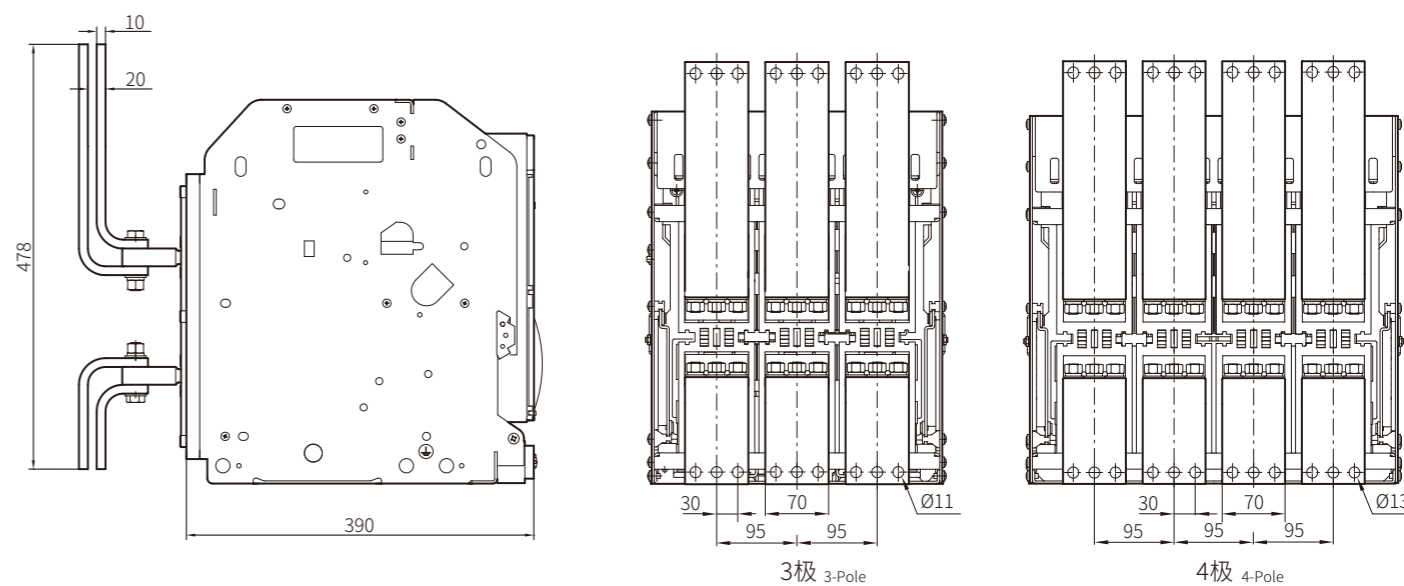


备注：尺寸单位为mm Remarks: The dimensions unit is mm

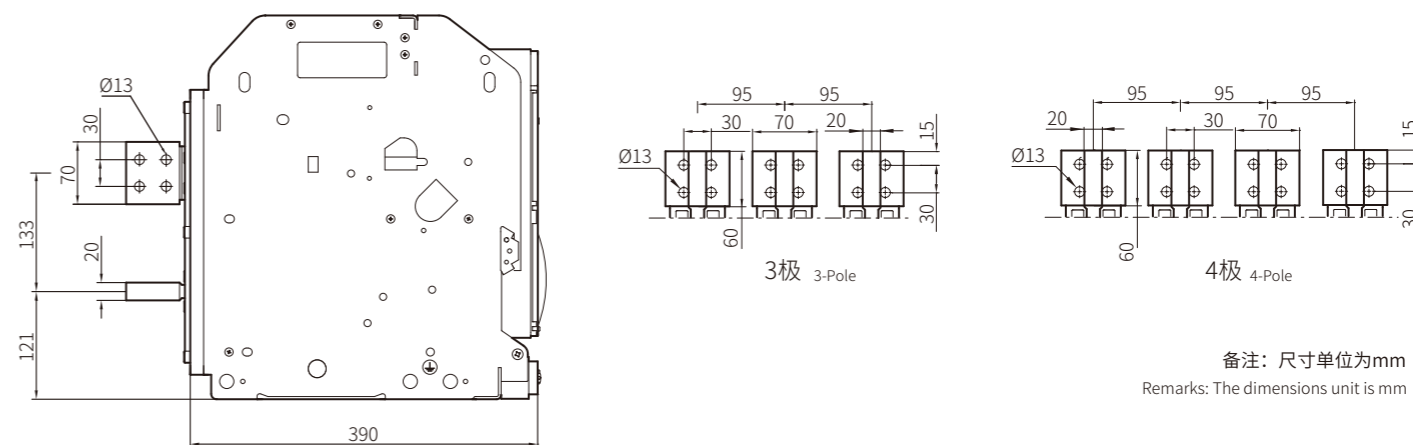
抽屉式断路器 垂直后连接 Withdrawable type circuit breaker Vertical back connection



抽屉式断路器 前连接 Withdrawable type circuit breaker Front connection



抽屉式断路器 混合后连接 Withdrawable type circuit breaker Mixed back connection

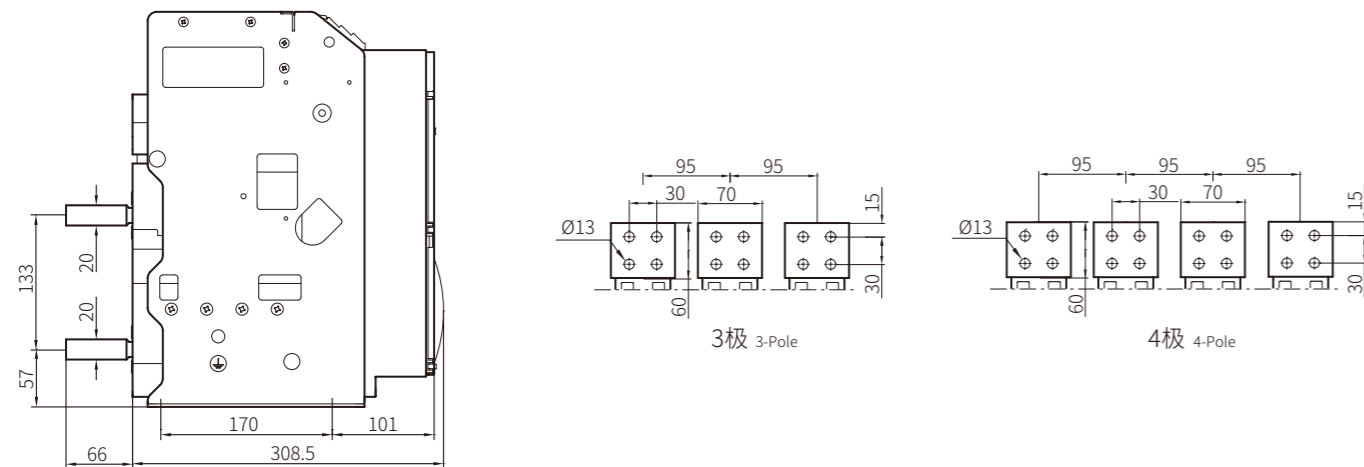
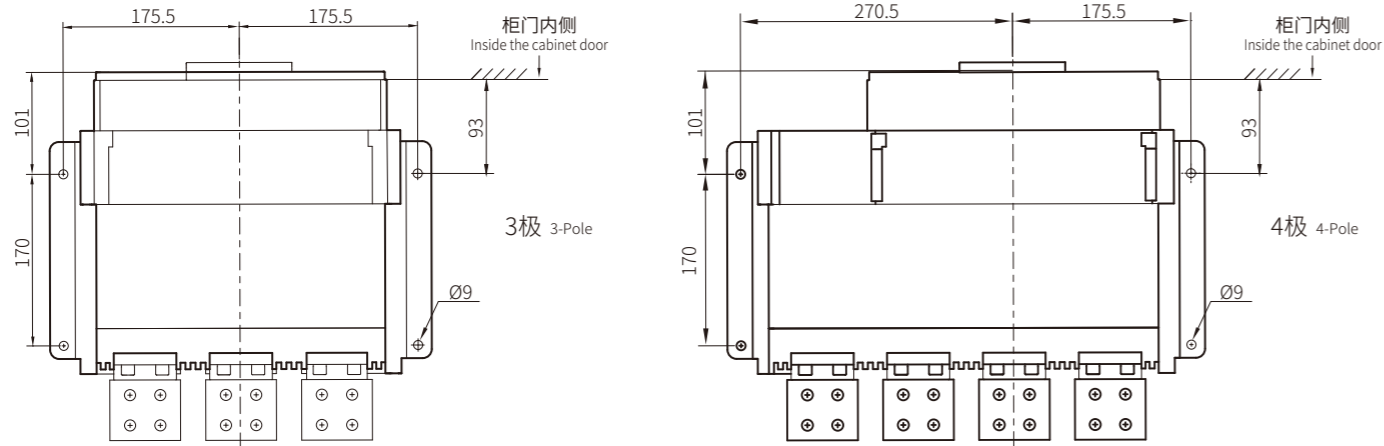
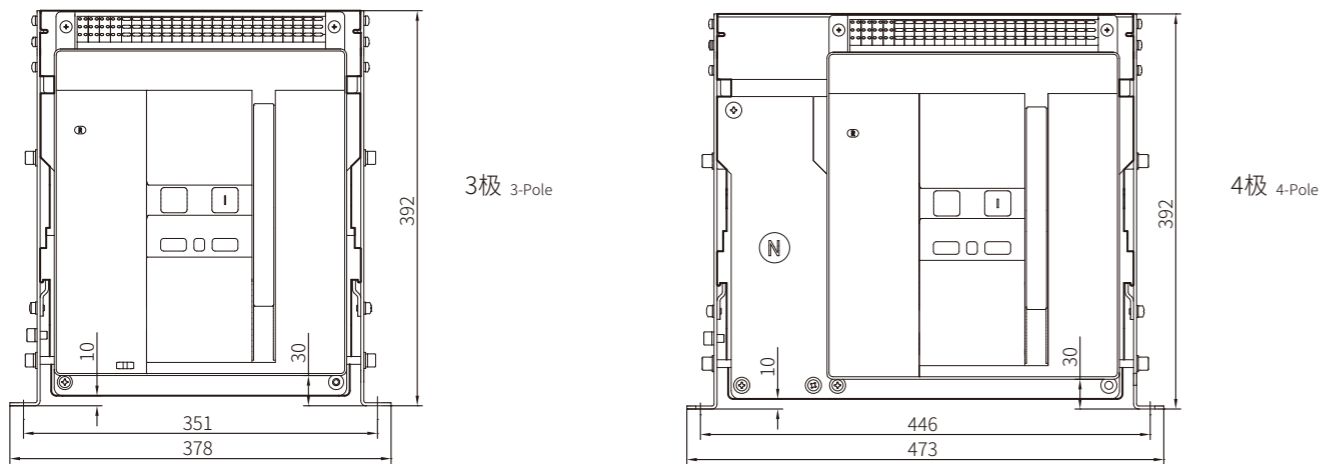


备注：尺寸单位为mm Remarks: The dimensions unit is mm

KFW5-2500 固定式断路器
KFW5-2500 fixed type circuit breaker

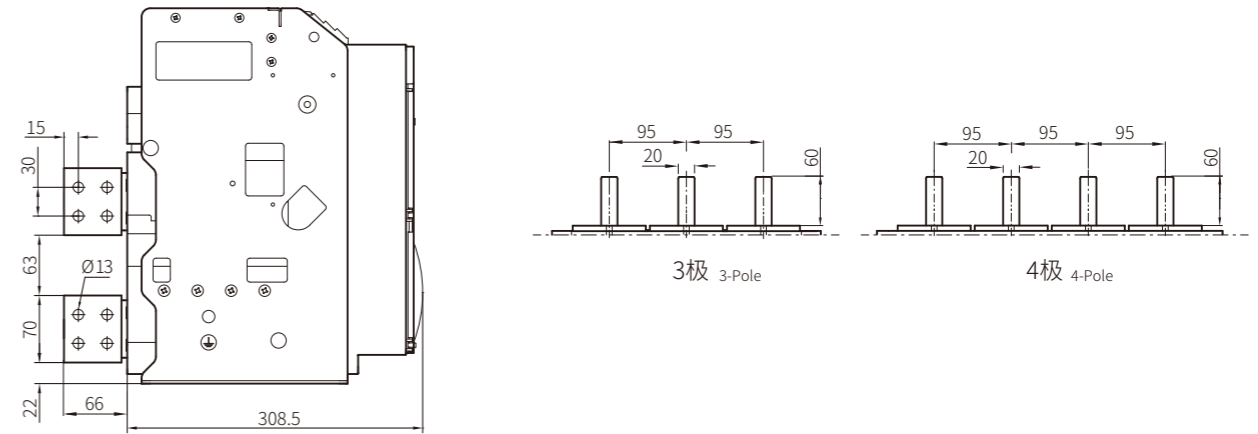
安装尺寸
Dimensions installation

固定式断路器 水平后连接 Fixed type circuit breaker Horizontal back connection

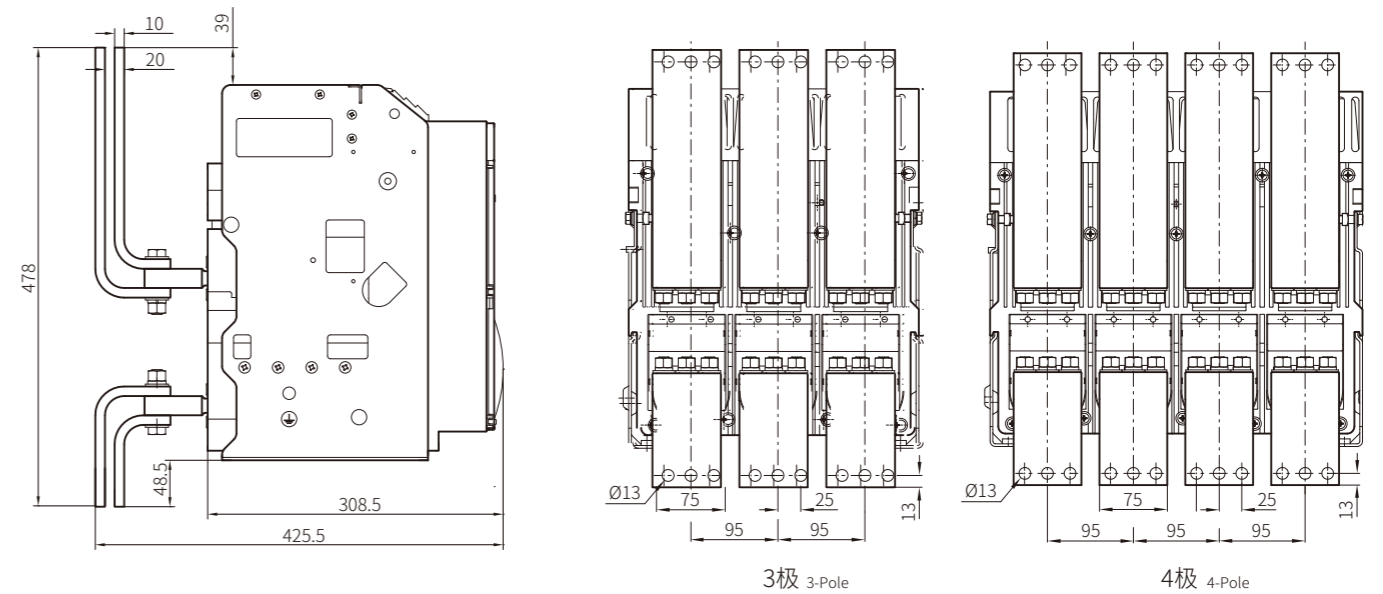


备注：尺寸单位为mm Remarks: The dimensions unit is mm

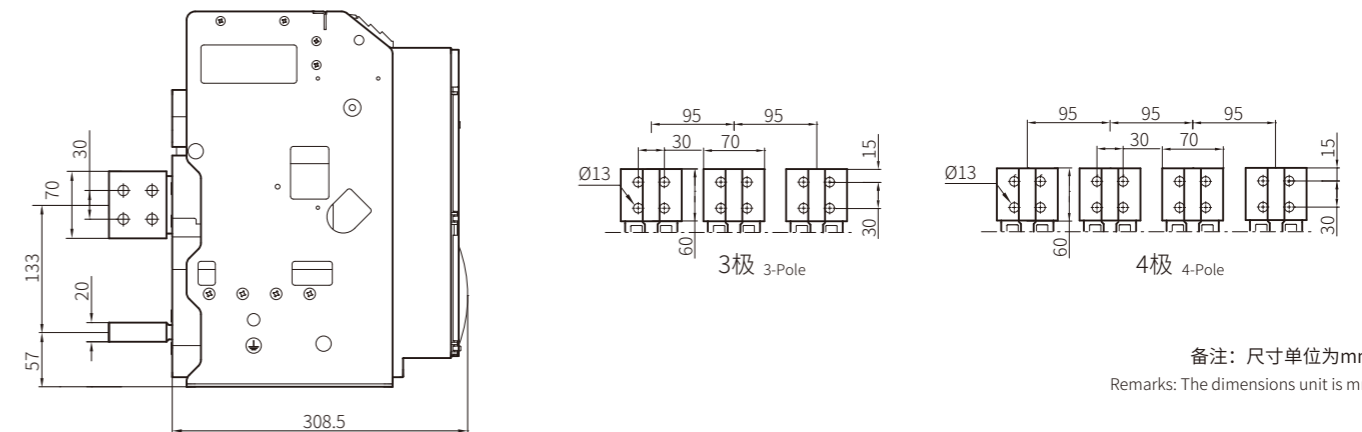
固定式断路器 垂直后连接 Fixed type circuit breaker Vertical back connection



固定式断路器 前连接 Fixed type circuit breaker Front connection



固定式断路器 混合后连接 Fixed type circuit breaker Mixed back connection

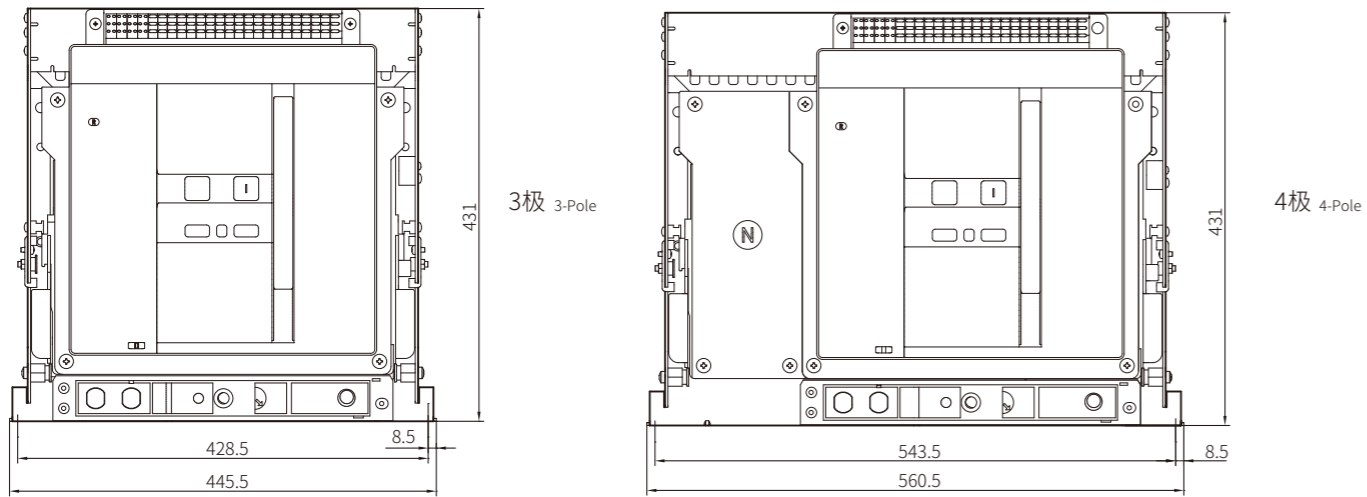


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Remarks: The dimensions unit is mm

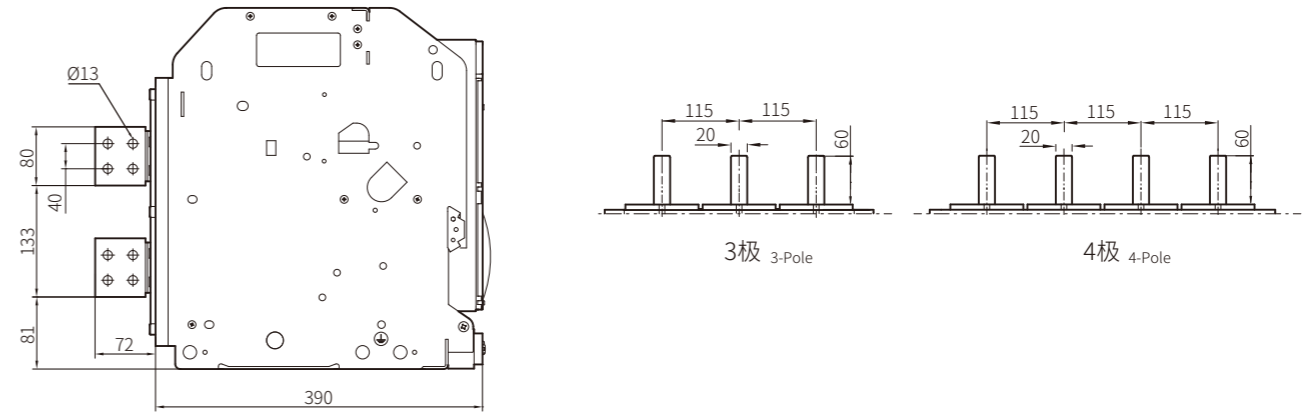
KFW5-4000 抽屉式断路器
KFW5-4000 withdrawable type circuit breaker

安装尺寸
Dimensions installation

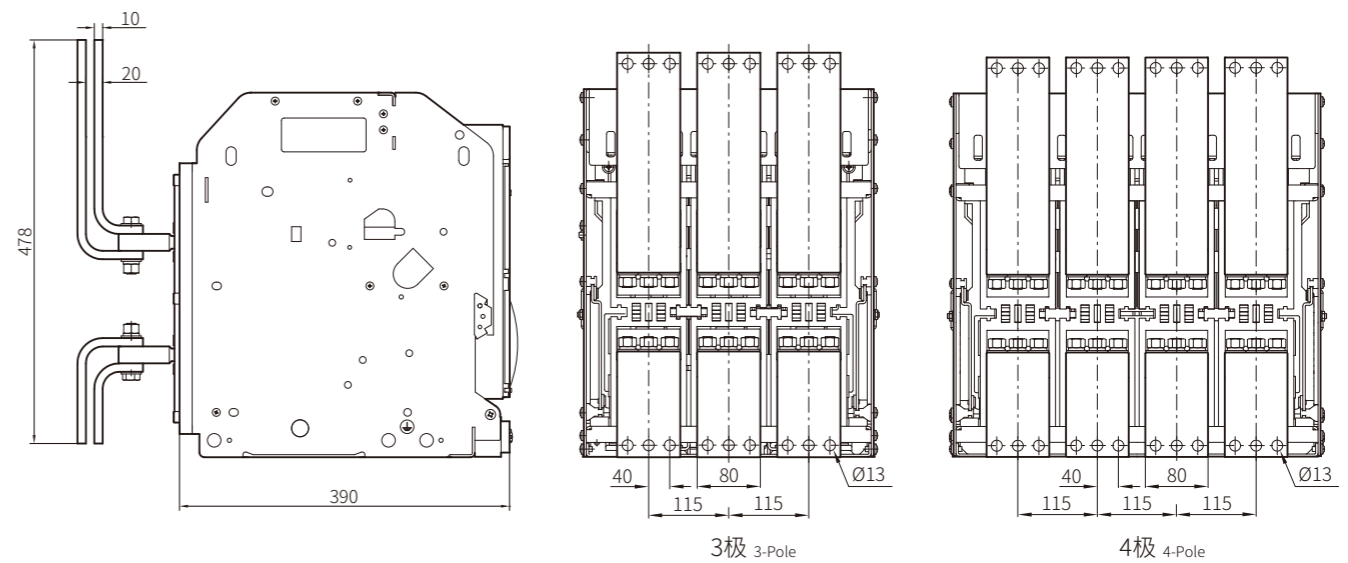
抽屉式断路器 水平后连接 Withdrawable type circuit breaker Horizontal back connection



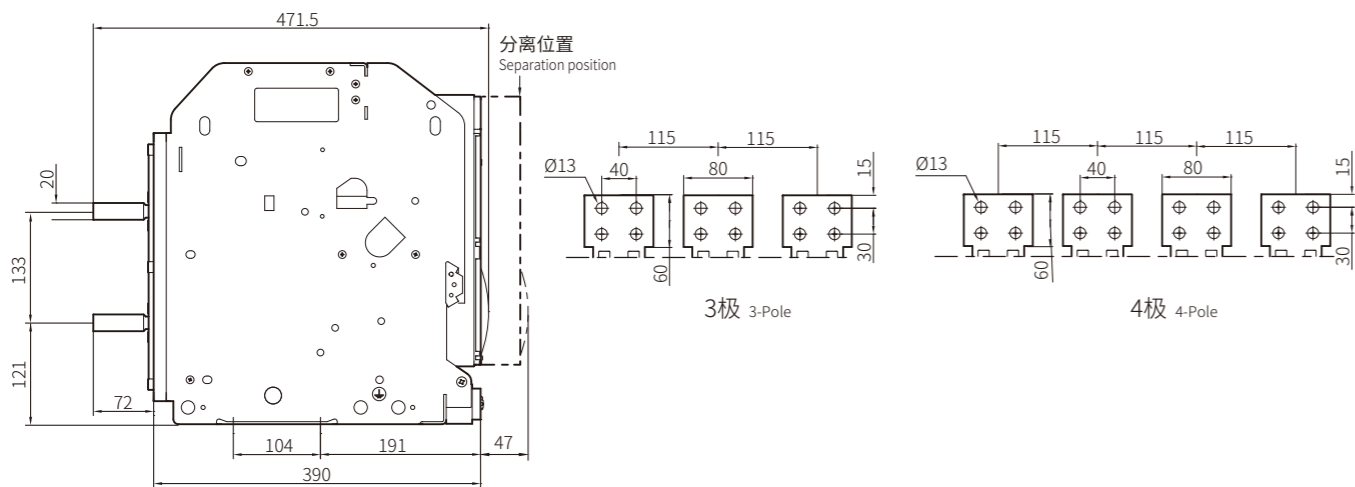
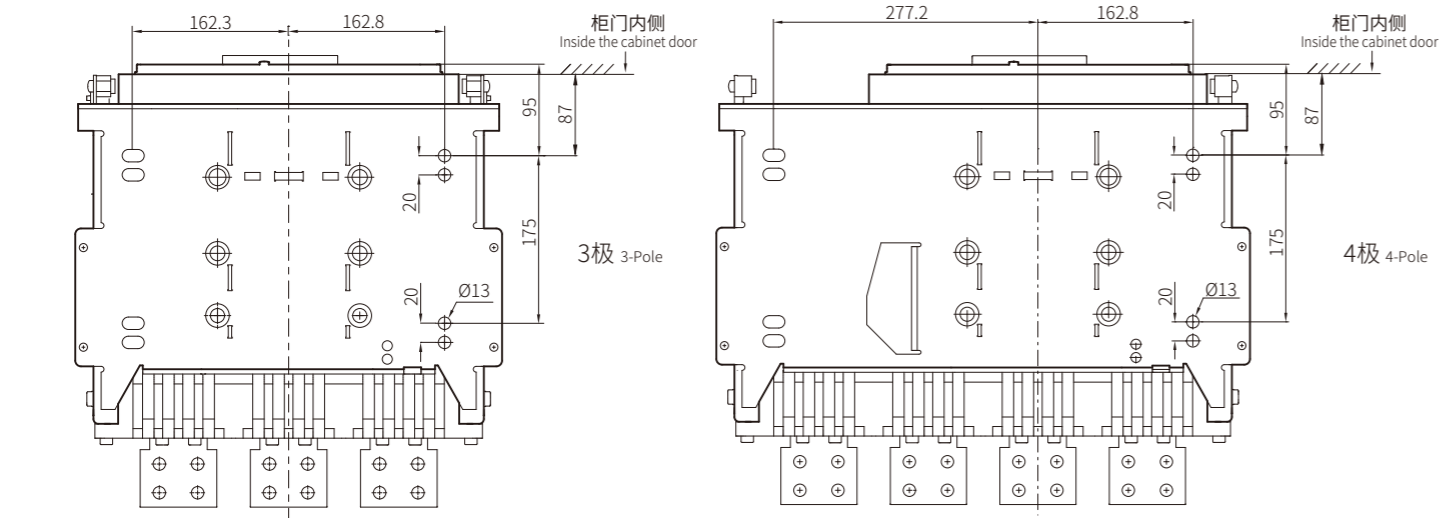
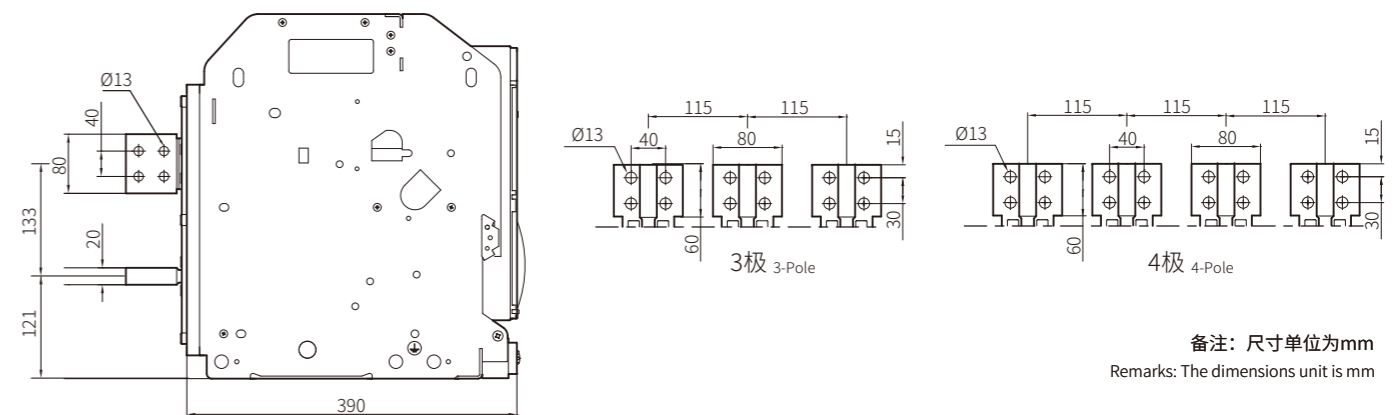
抽屉式断路器 垂直后连接 Withdrawable type circuit breaker Vertical back connection



抽屉式断路器 前连接 Withdrawable type circuit breaker Front connection



抽屉式断路器 混合后连接 Withdrawable type circuit breaker Mixed back connection



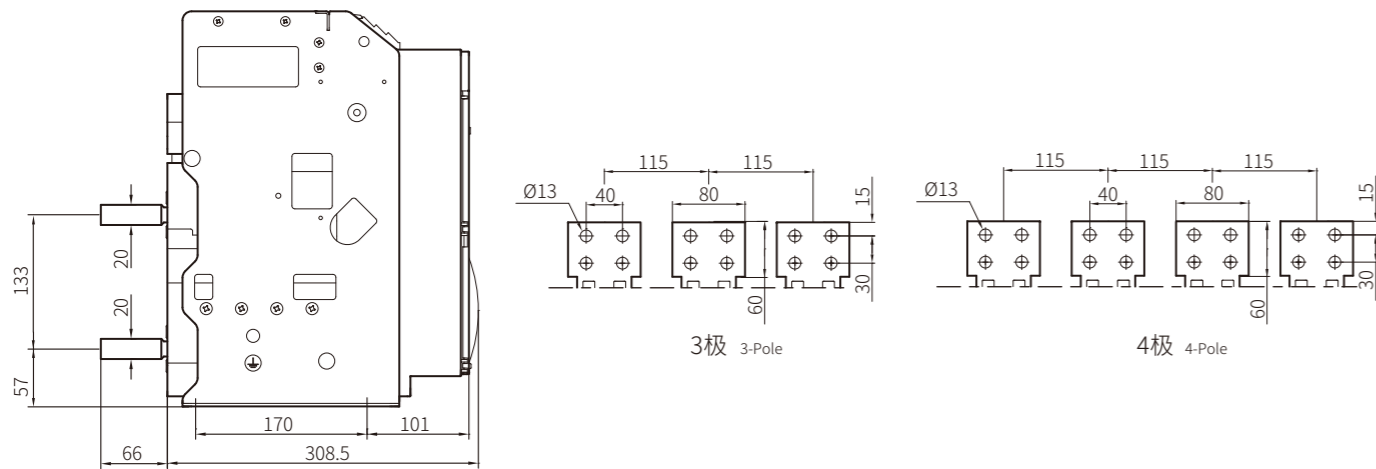
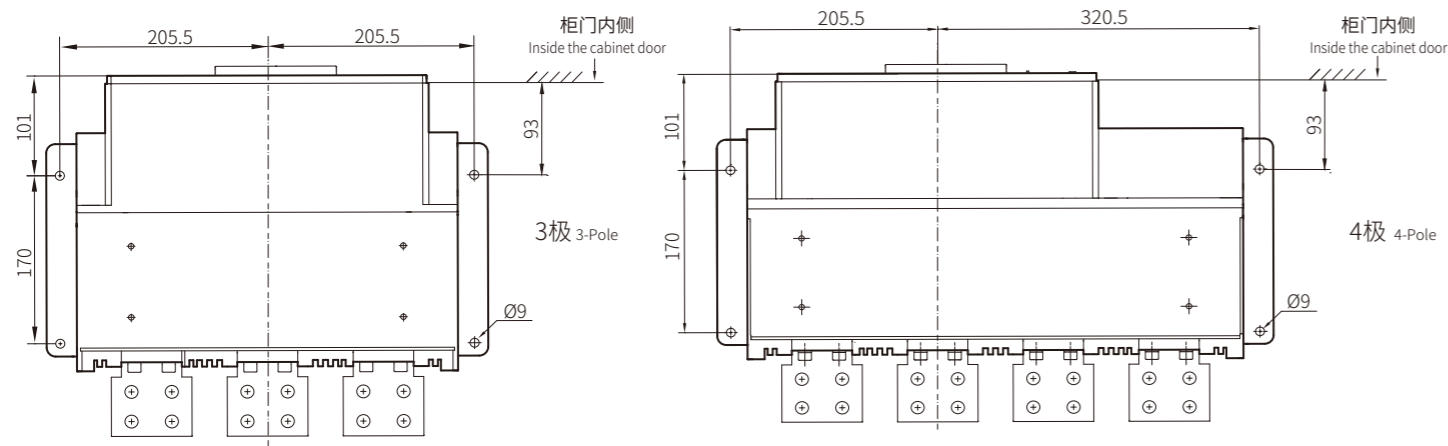
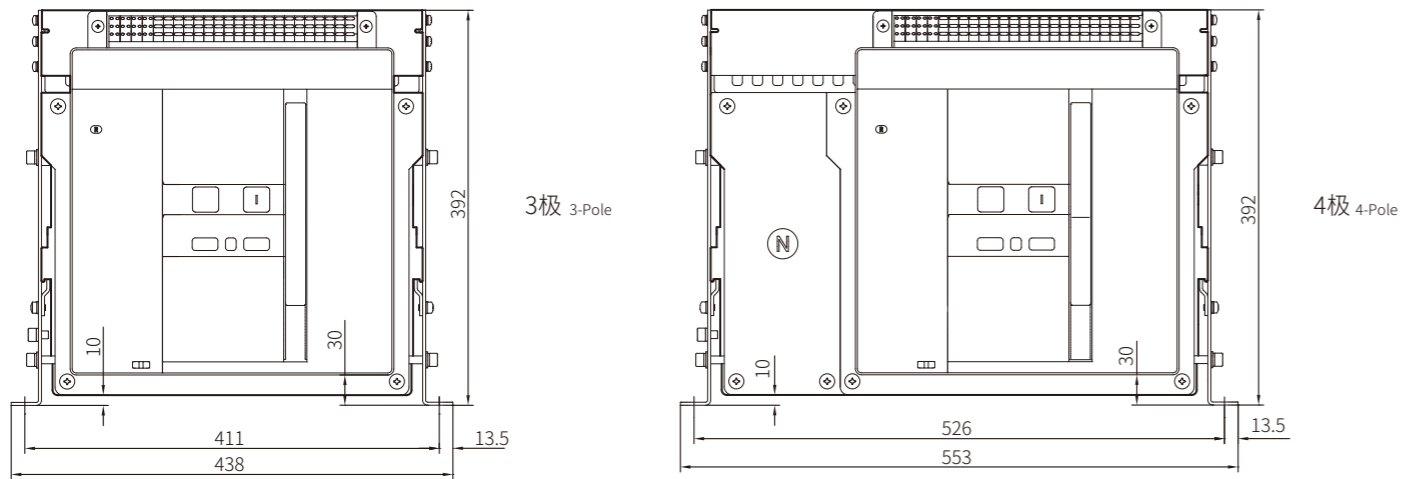
备注：尺寸单位为mm Remarks: The dimensions unit is mm

备注：尺寸单位为mm
Remarks: The dimensions unit is mm

KFW5-4000 固定式断路器
KFW5-4000 fixed type circuit breaker

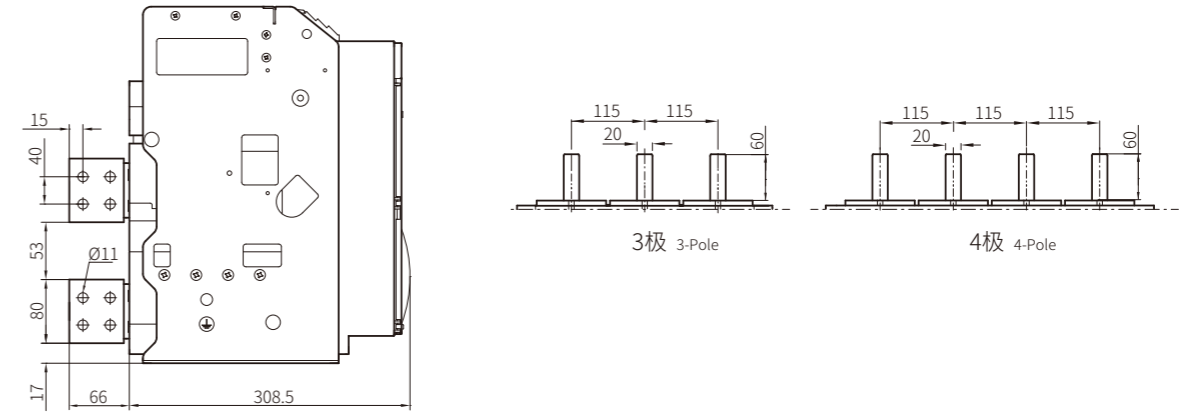
安装尺寸
Dimensions installation

固定式断路器 水平后连接 Fixed type circuit breaker Horizontal back connection

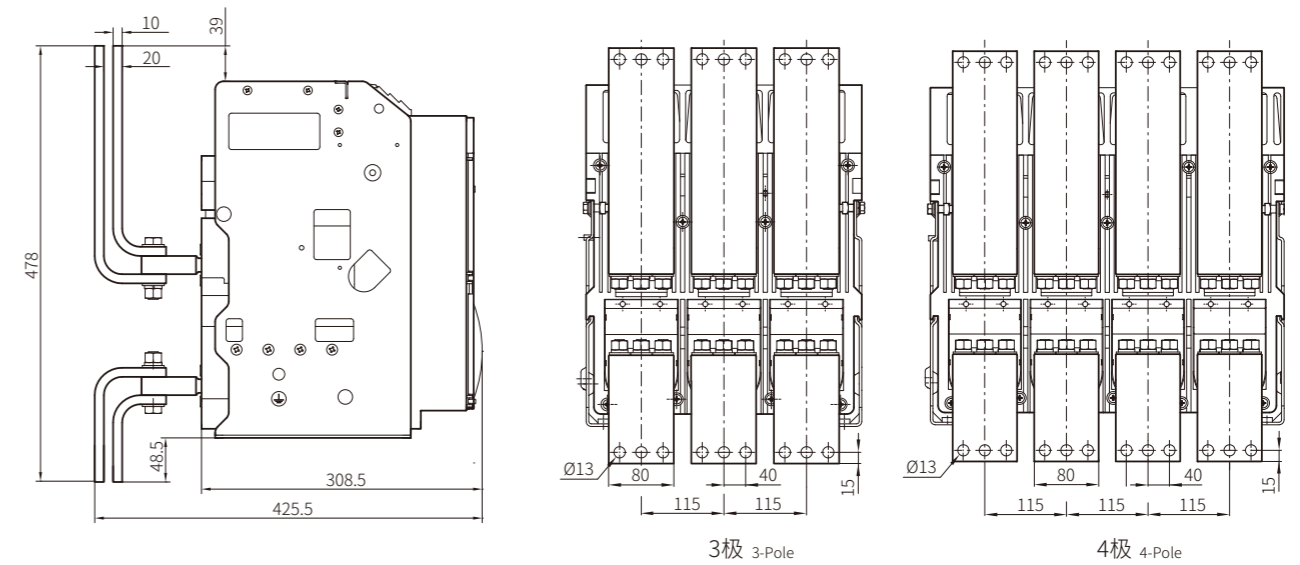


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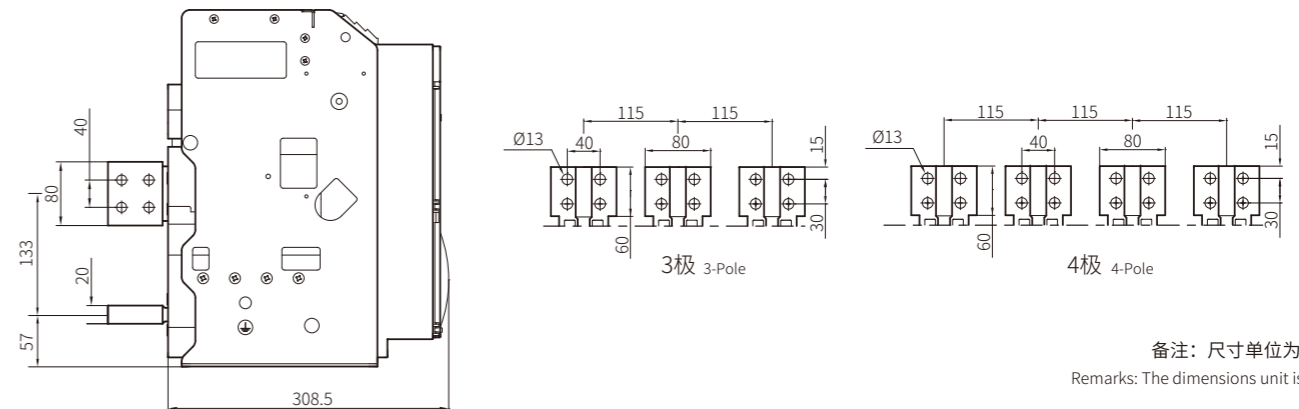
固定式断路器 垂直后连接 Fixed type circuit breaker Vertical back connection



固定式断路器 前连接 Fixed type circuit breaker Front connection



固定式断路器 混合后连接 Fixed type circuit breaker Mixed back connection

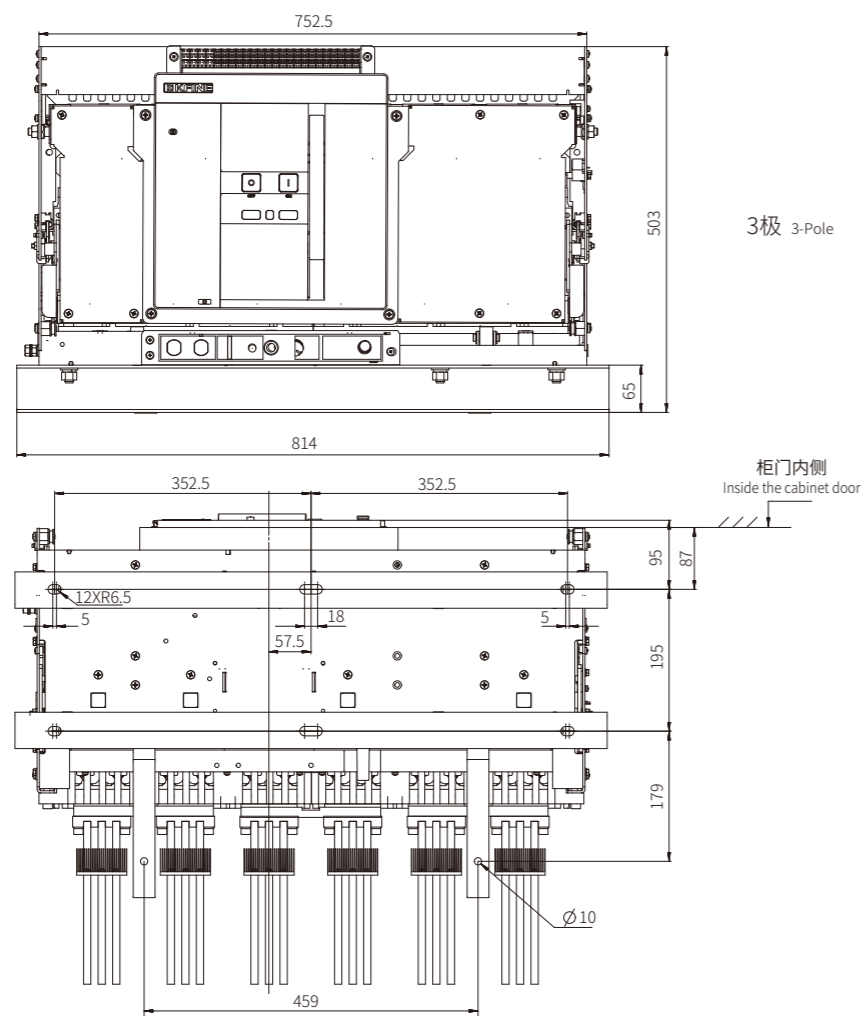


备注：尺寸单位为mm
Remarks: The dimensions unit is mm

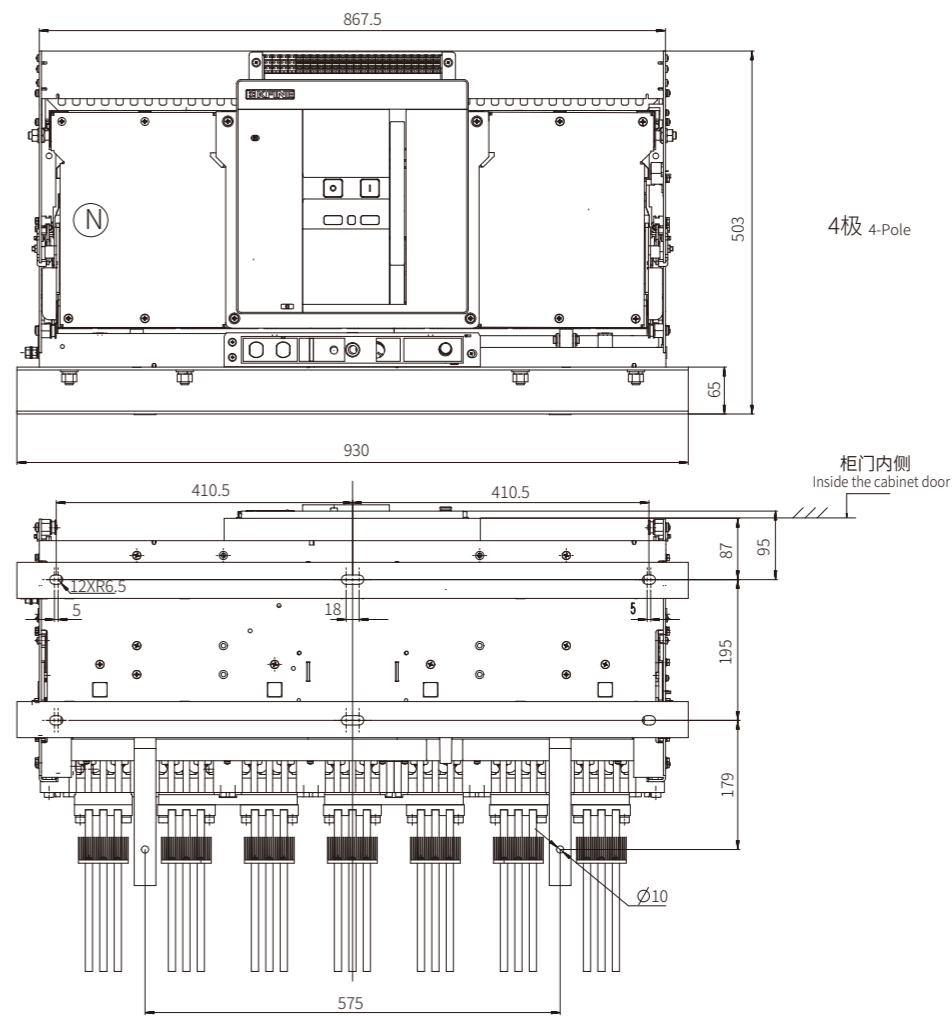
KFW5-7500 抽屉式断路器
KFW5-7500 withdrawable type circuit breaker

安装尺寸
Dimensions installation

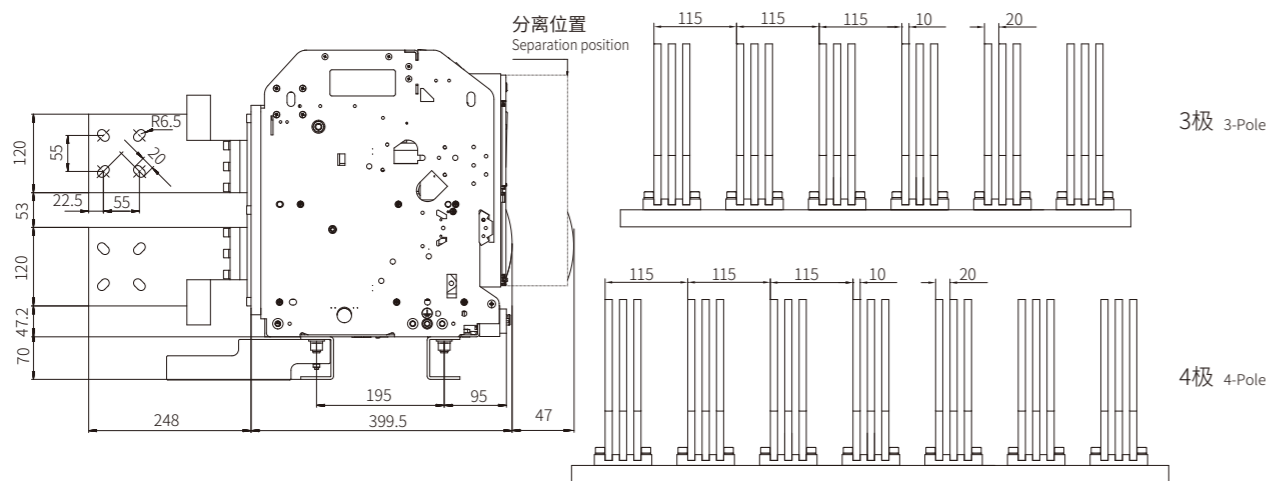
抽屉式断路器 Withdrawable type circuit breaker



抽屉式断路器 Withdrawable type circuit breaker

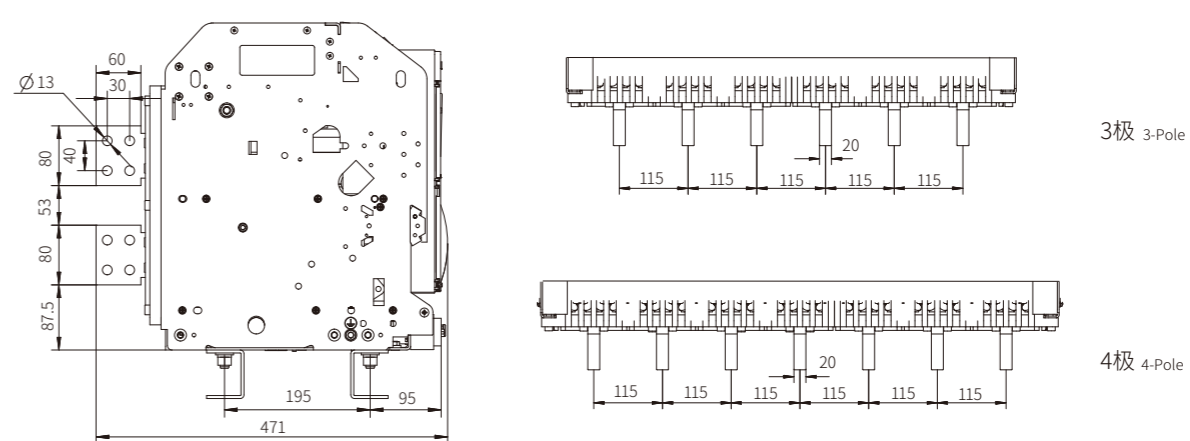


抽屉式断路器 垂直后连接 (7500A) Withdrawable type circuit breaker Vertical back connection



备注: 尺寸单位为mm Remarks: The dimensions unit is mm

抽屉式断路器 垂直后连接 (4000-6300A) Withdrawable type circuit breaker Vertical back connection

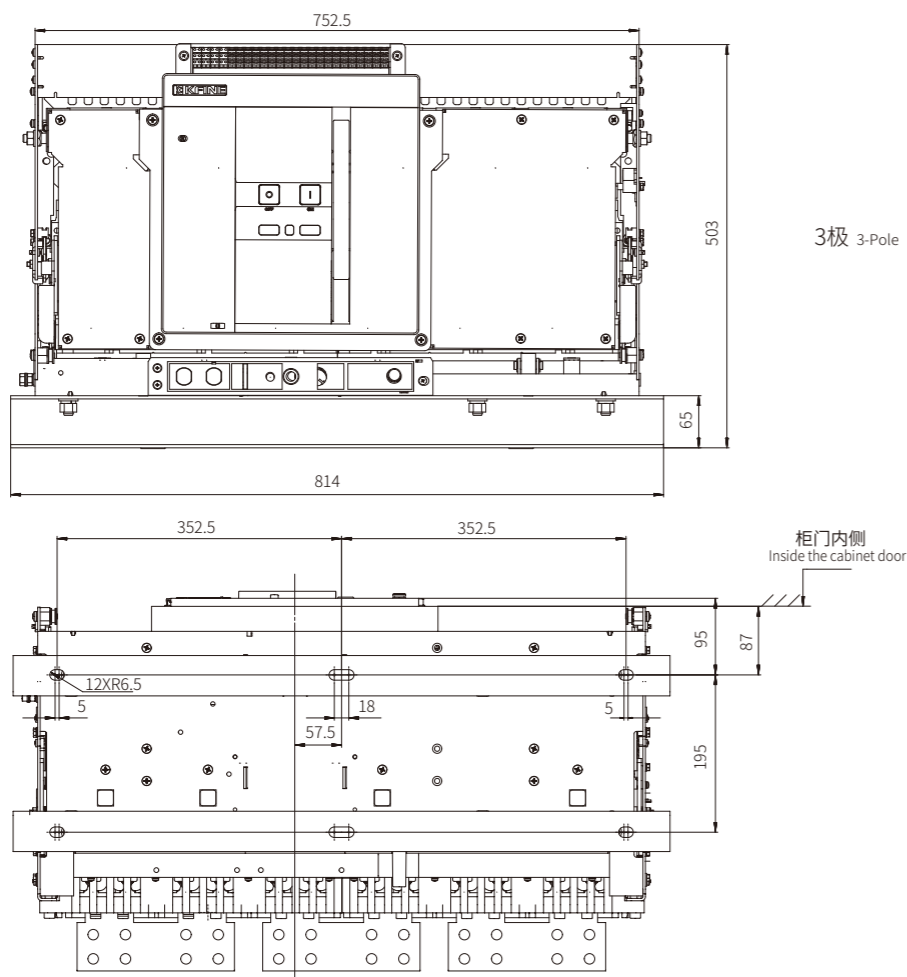


备注: 尺寸单位为mm
Remarks: The dimensions unit is mm

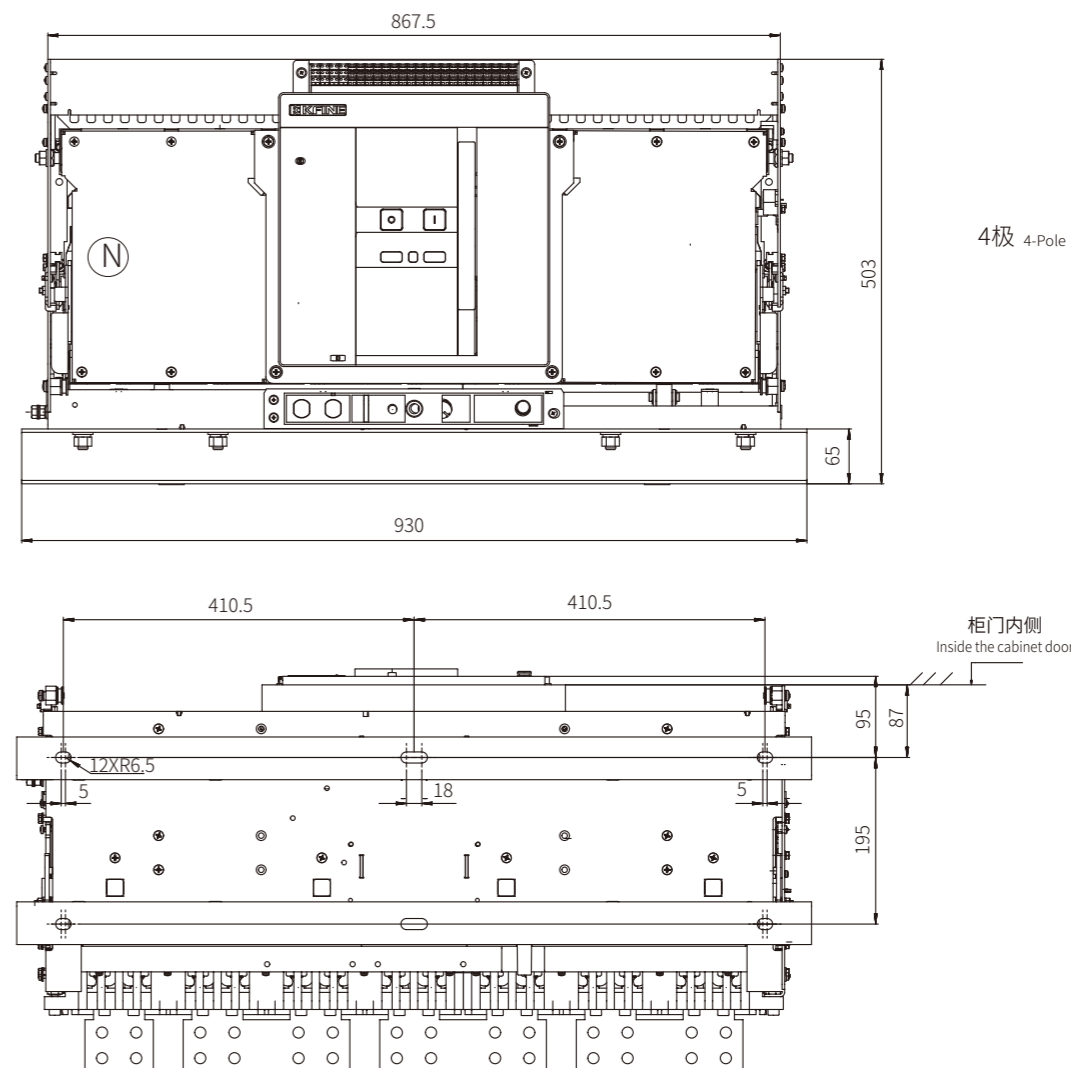
KFW5-7500 抽屉式断路器
KFW5-7500 withdrawable type circuit breaker

安装尺寸
Dimensions installation

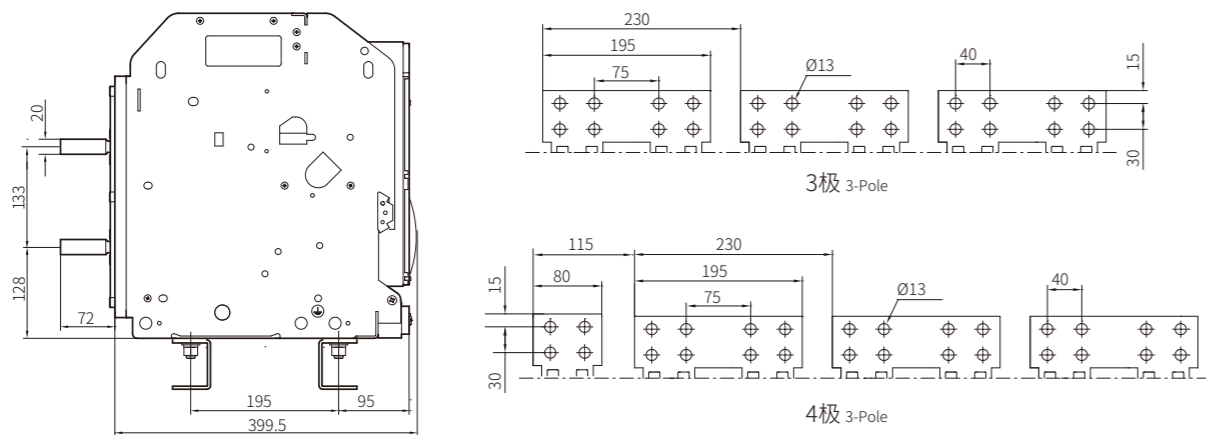
抽屉式断路器 Withdrawable type circuit breaker



抽屉式断路器 Withdrawable type circuit breaker



抽屉式断路器 垂直后连接 (4000-7500A) Withdrawable type circuit breaker Vertical back connection



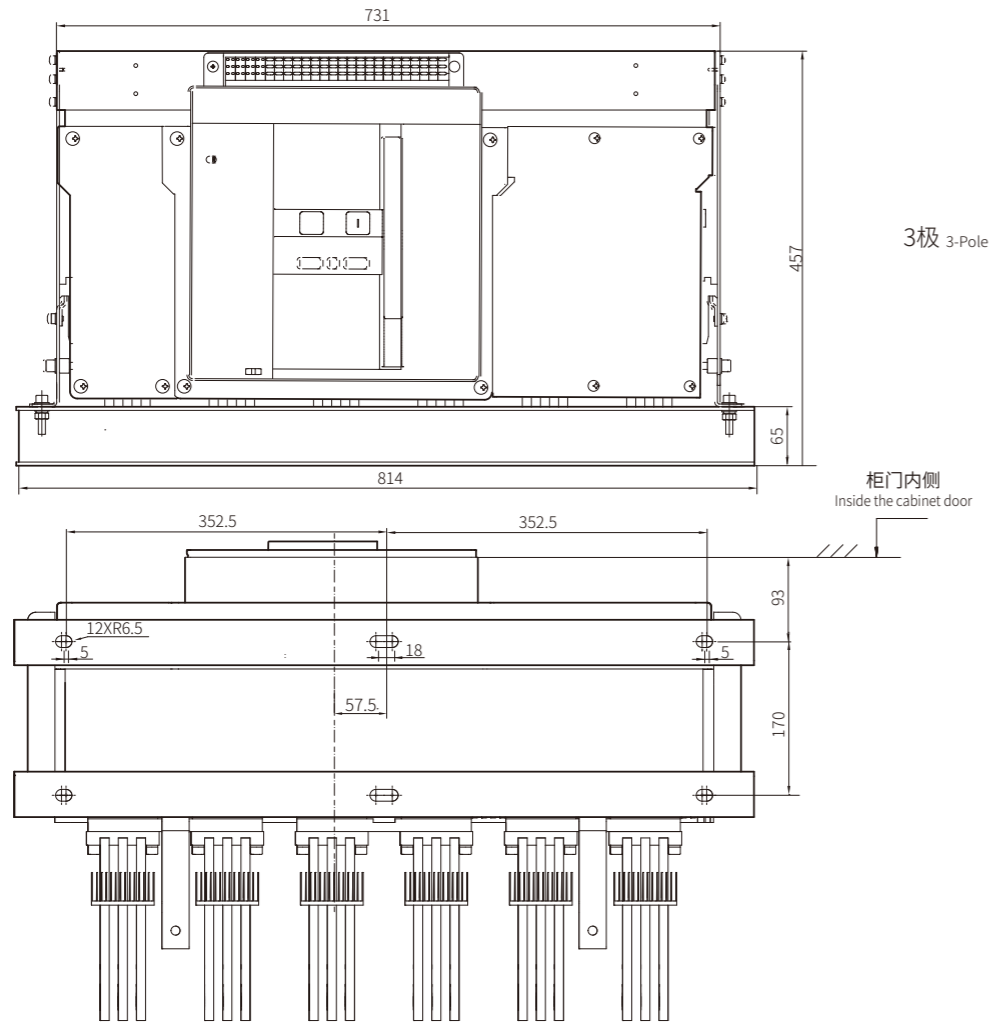
备注：尺寸单位为mm Remarks: The dimensions unit is mm

备注：尺寸单位为mm
Remarks: The dimensions unit is mm

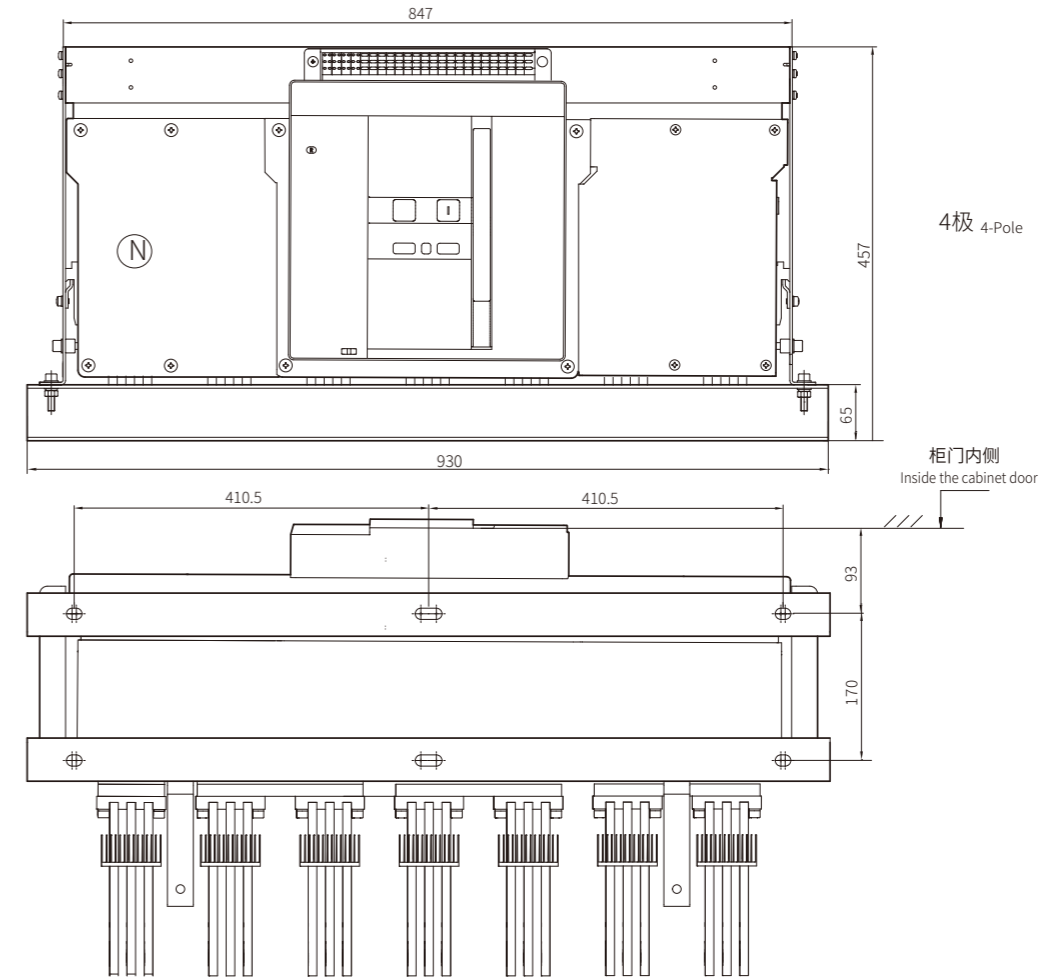
KFW5-7500 固定式断路器
KFW5-7500 fixed type circuit breaker

安装尺寸
Dimensions installation

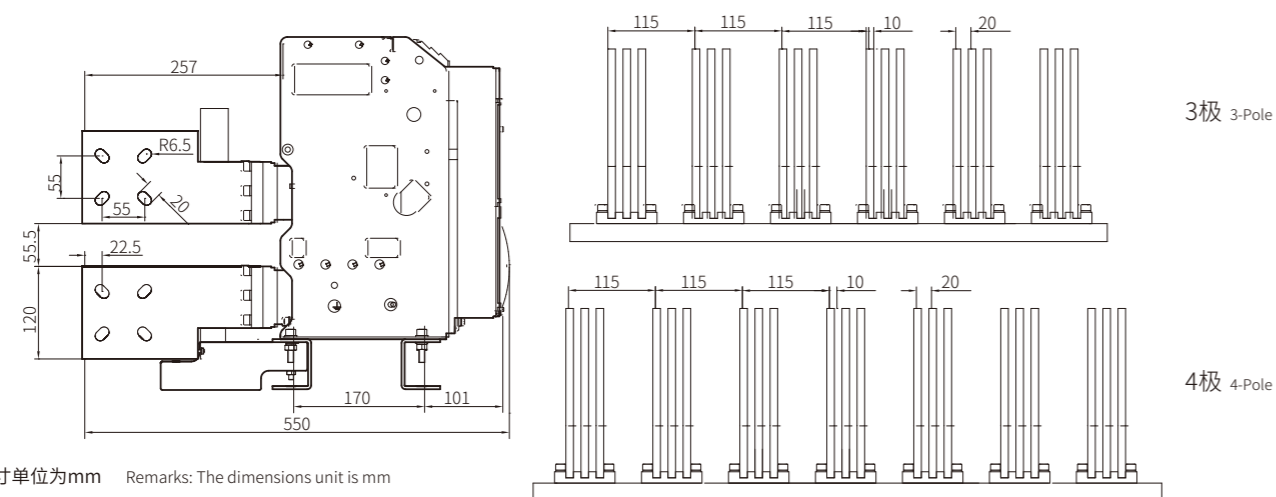
固定式断路器 Fixed type circuit breaker



固定式断路器 Fixed type circuit breaker

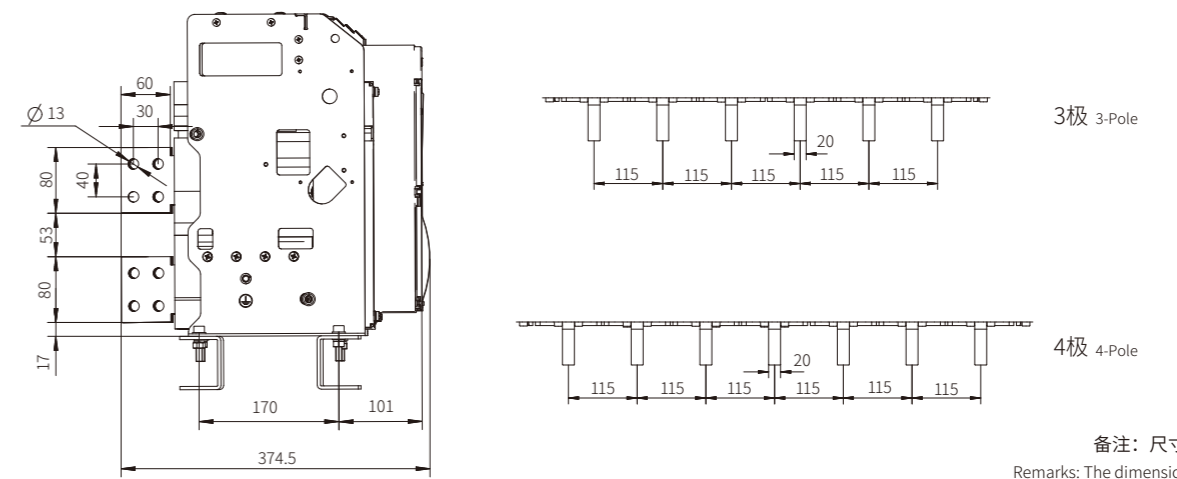


固定式断路器 垂直后连接 (7500A) Fixed type circuit breaker Vertical back connection



备注：尺寸单位为mm Remarks: The dimensions unit is mm

固定式断路器 垂直后连接 (4000-6300A) Fixed type circuit breaker Vertical back connection

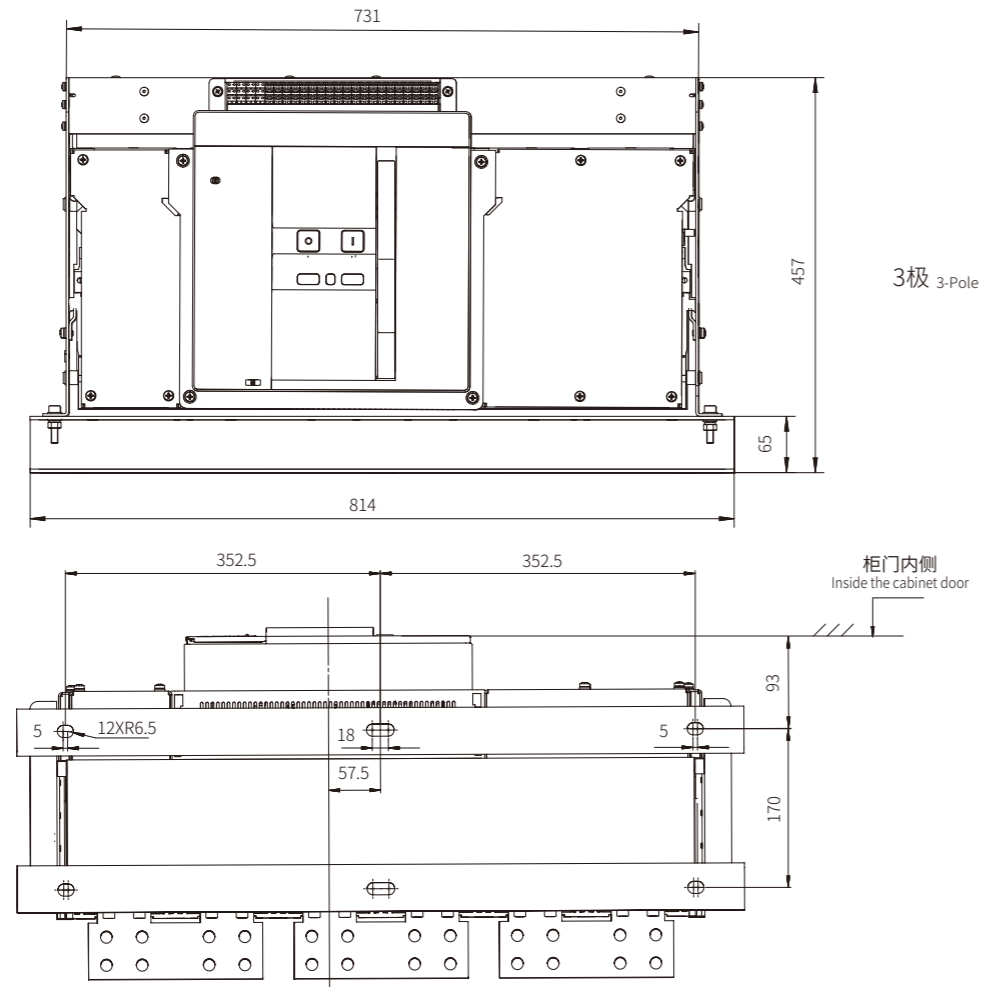


备注：尺寸单位为mm
Remarks: The dimensions unit is mm

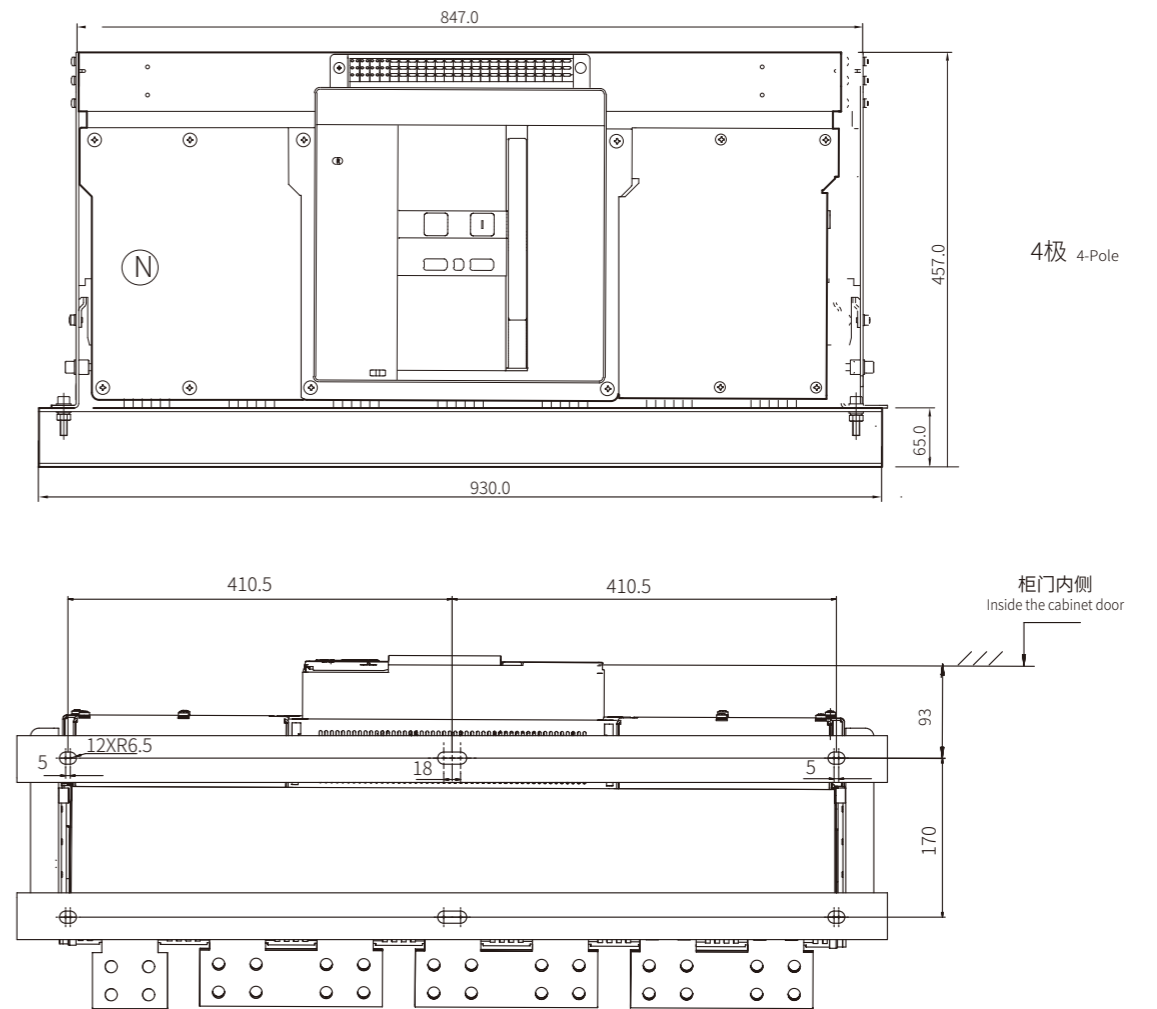
KFW5-7500 固定式断路器
KFW5-7500 fixed type circuit breaker

安装尺寸
Dimensions installation

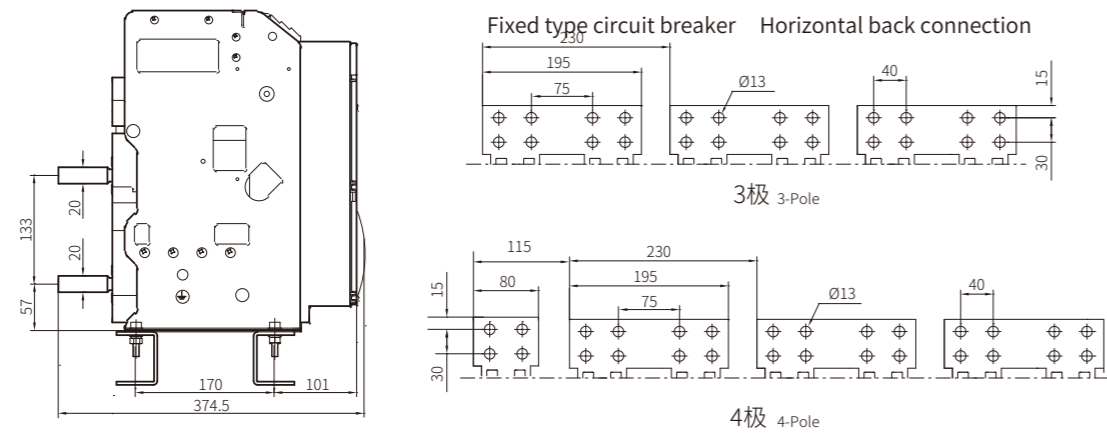
固定式断路器 Fixed type circuit breaker



固定式断路器 Fixed type circuit breaker



固定式断路器 水平后连接 (4000-7500A)



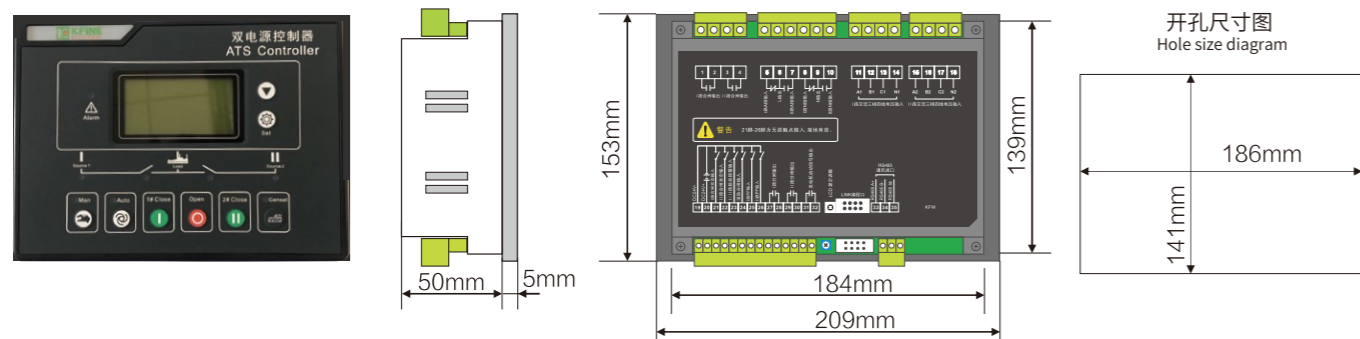
备注：尺寸单位为mm Remarks: The dimensions unit is mm

备注：尺寸单位为mm
Remarks: The dimensions unit is mm

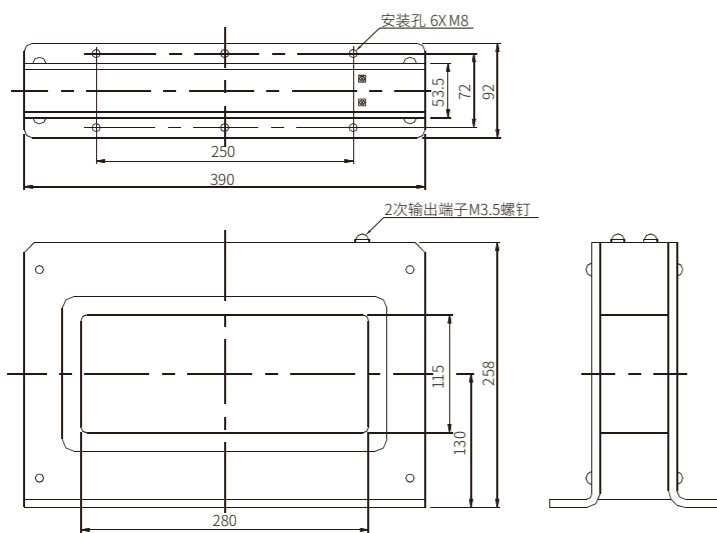
附件尺寸
Accessory dimensions

安装尺寸
Dimensions installation

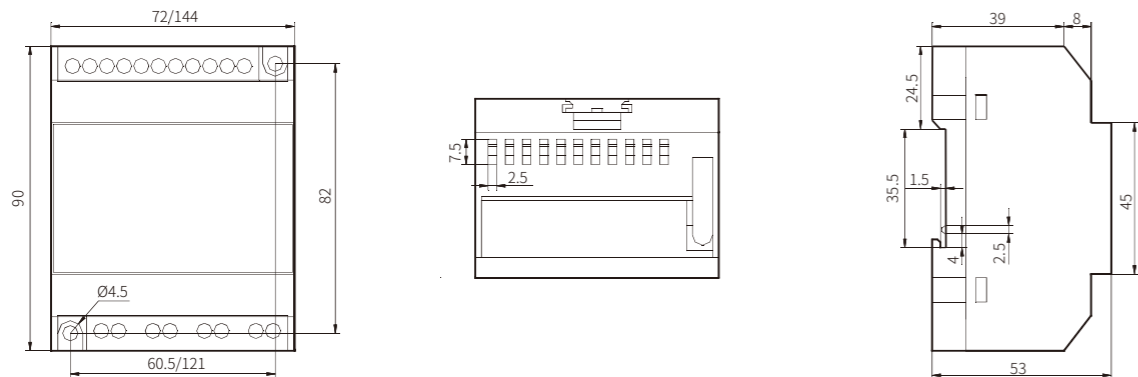
双电源控制器 Dual power controller



ZCT漏电互感器 ZCT leakage transformer



ST电源模块、ST201继电器模块 ST power module, ST201 relay module

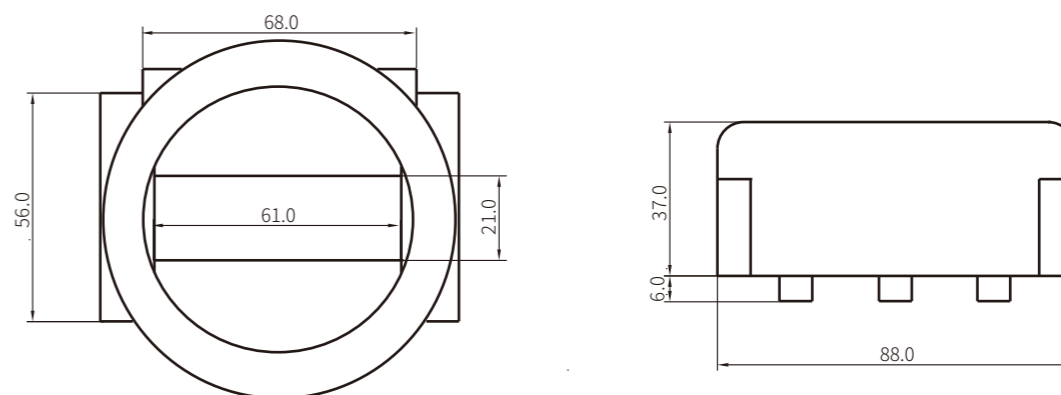


备注：尺寸单位为mm
Remarks: The dimensions unit is mm

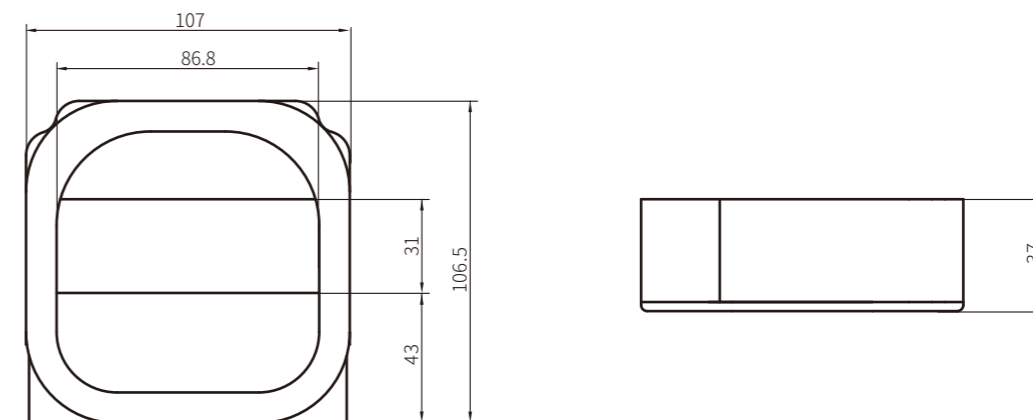
ST电源模块可用作ST201继电器模块的电源，产品采用35mm标准导轨及直接固定两种安装方式，外形及安装尺寸如图所示。
ST201继电器模块外形尺寸及安装尺寸同ST电源模块。

ST power module can be used as the power supply of ST201 relay module. The product adopts 35mm standard guide rail and direct fixing two installation methods. The appearance and installation size are shown in the figure.
The external dimension and installation dimension of ST201 relay module are the same as that of ST power module.

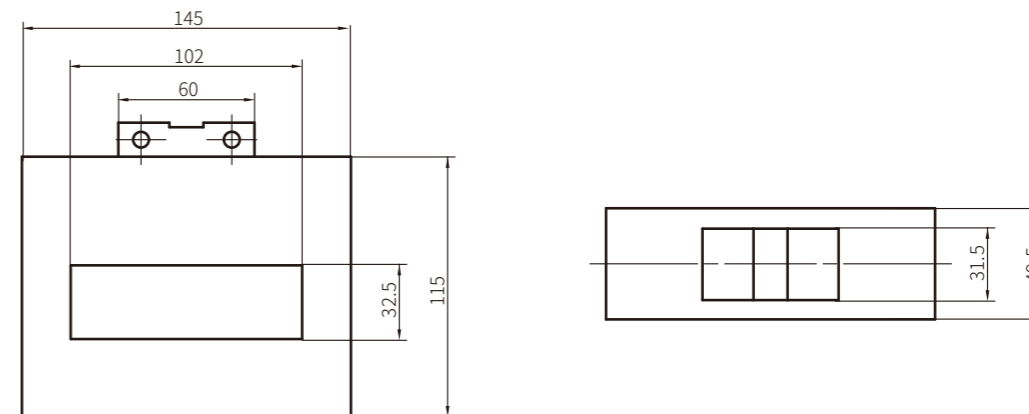
KFW5-1600 外接 N 相电流互感器 KFW5-1600 external N phase current transformer



KFW5-2500 外接 N 相电流互感器 KFW5-2500 external N phase current transformer

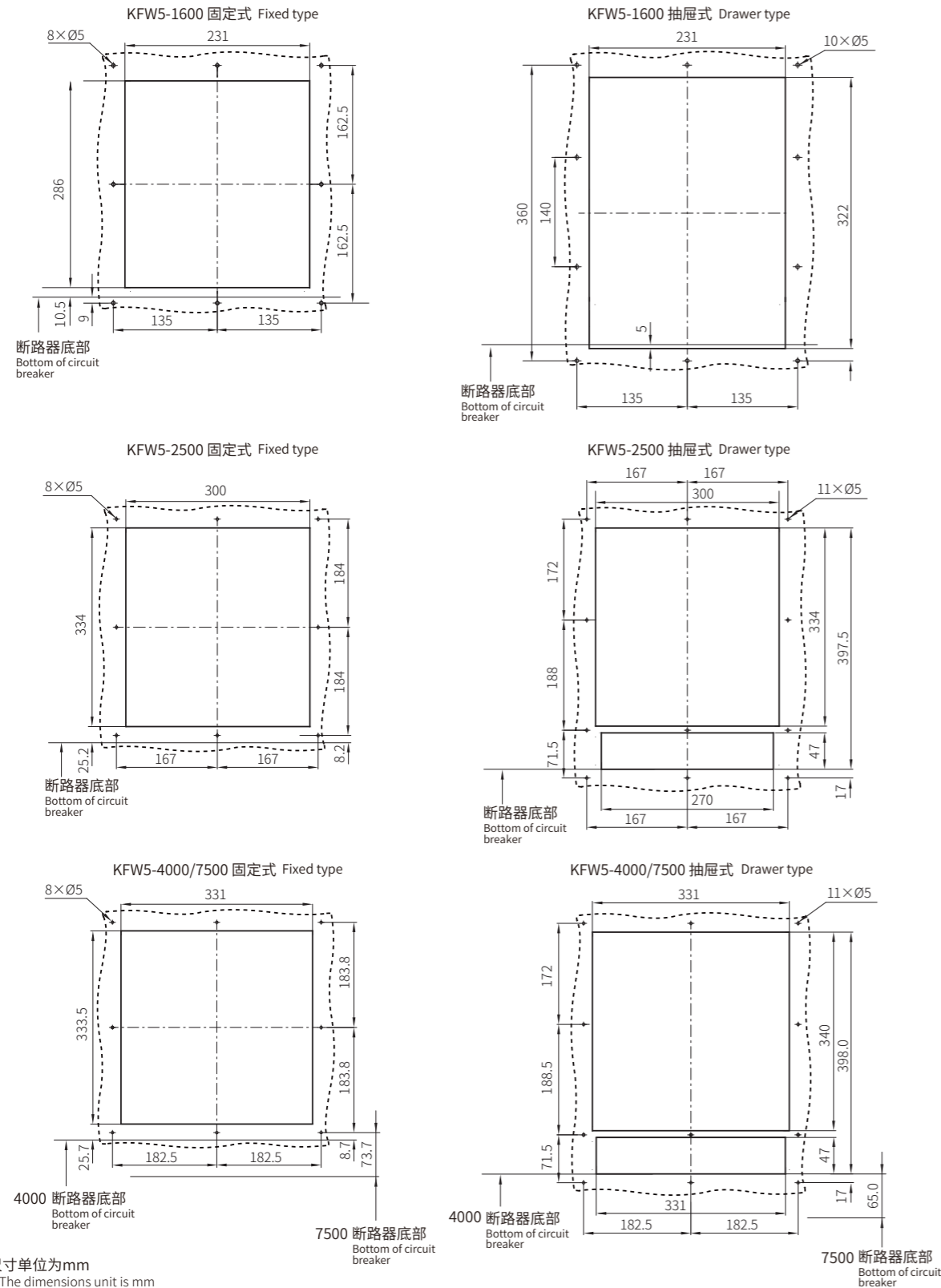


KFW5-4000 外接 N 相电流互感器 KFW5-4000 external N phase current transformer



备注：尺寸单位为mm
Remarks: The dimensions unit is mm

柜门开孔 Opening of cabinet door



备注：尺寸单位为mm
Remarks: The dimensions unit is mm

端子连接方式 Terminal connection mode

KFW5 框架断路器提供多种母排连接方式，客户可根据需要选择水平后连接、垂直后连接、前连接、或混合后连接的接线方式。
KFW5 frame circuit breakers provide a variety of busbar connection methods, and the customers can choose horizontal rear connection, vertical rear connection, front connection, or mixed rear connection according to their needs.

连接方式 Connection modes			
固定式 Fixed type	固定式 Fixed type	抽屉式 Drawer type	抽屉式 Drawer type
水平后连接	Horizontal rear connection	水平后连接	Horizontal rear connection
垂直后连接	Vertical rear connection	垂直后连接	Vertical rear connection
前连接	Front connection	前连接	Front connection
混合后连接	Mixed rear connection	混合后连接	Mixed rear connection

防护等级 Protection class

KFW5 断路器提供以下防护等级：
KFW5 circuit breakers provide the following protection levels:

防护等级 Protection level	适用范围 Scope of application
IP20	本体 Nomenclature
IP40	本体带门框 Nomenclature with door frame

安装环境 Installation conditions

KFW5 断路器遵照相关国际标准进行设计和测试，可在各标准规定的情况下安装和使用。安装环境和符合标准如下：
KFW5 circuit breakers are designed and tested in accordance with relevant international standards, and can be installed and used under the conditions specified by the standards. The installation environment and applicable standards are as follows:

环境内容 Environmental contents	参数 Parameters	符合标准 Applicable standards
环境温度 Ambient temperature	工作温度：-25~+70°C 储存温度：-40~+85°C	IEC 60947-1 附录 Q CC2 IEC 60068-2-1/ IEC 60068-2-2
海拔 Altitude	≤2000 m	IEC 60947-1 6.1.2 表 12/表 14
污染等级 Pollution levels	3	IEC 60947-1 6.1.3.2 IEC 60664-1
电磁兼容性(EMC) Electromagnetic compatibility	1. 对地泄漏电流：B.7.21 2. ETU:F.4抗扰度试验；F.5发射试验 3. UVR、ST、电机等； N.2抗扰度；N.3发射	IEC 60947-2，附录 B/F/N (Appendix) IEC 61000-4
震动和冲击 Vibration and shock	2-13.2Hz 位移：±1mm 13.2-100Hz 加速度：±0.7g 最大加速度：150m/s ² 2-13.2Hz displacement: ±1mm 13.2-100Hz Acceleration: ±0.7g Maximum acceleration: 150m/s ²	IEC 60947-1 附录 Q (Appendix) IEC 60068-2-6 IEC 60068-2-27
盐雾试验 Salt spray test	严重等级 2 Severity level 2	IEC 60947-1 附录 Q SC2 IEC 60068-2-52
H ₂ S	3C3 浓度范围 2.1~7.1×10 ⁻⁶ 3C3 depth range 2.1~7.1×10 ⁻⁶	IEC 60721-3-3 IEC 60068-2-43
SO ₂	3C4 浓度范围 4.8~14.8×10 ⁻⁶ 3C4 depth range 4.8~14.8×10 ⁻⁶	IEC 60721-3-3 IEC 60068-2-42

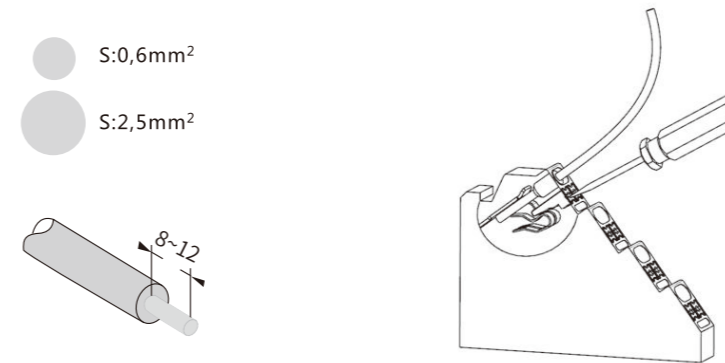
注：仍建议此断路器在无过多灰尘污染、温度适宜的开关柜中使用。
Note: It is still recommended to use the circuit breaker in a switch cabinet without excessive dust pollution and at suitable temperature.

主回路接线铜排规格参数表 Main circuit wiring copper bar specification parameter list

壳架等级额定电流 Inm(A) Shell frame rated current	额定电流 Inm(A) Rated current	铜排规格 Copper platoon specifications		连接型式 Connection type	
		根数 Number of roots	尺寸 Size	抽屉 Drawer	固定 Fixed
KFW5-1600	200	1	50×5		
	400	1	50×5		
	630	2	50×5		
	800	2	50×5		
	1000	3	50×5		
	1250	4	50×5		
	1600	4	50×5		
KFW5-2500	630	2	80×5		a
	800	2	80×5		a
	1000	2	80×5		a
	1250	3	80×5		a
	1600	2	80×10		a
	2000	2	80×10		a
	2500	3	80×10		a
KFW5-4000	1000	2	80×5		b
	1250	3	80×5		b
	1600	2	80×10		b
	2000	2	80×10		b
	2500	3	80×10		b
	2900	5	100×10		b
	3200	5	100×10		b
	3600	5	100×10		b
KFW5-7500	4000	5	100×10		c
	5000	6	100×10		c
	6300	8	100×10		c
	7500	8	120×10		c

二次端子接线 Secondary terminal wiring

线型: 多股硬线、软线、带端子的软线 Wire type: multi stranded hard wire, flexible wire, and flexible wire with terminals



环境温度变化降容系数表 Derating coefficient for ambient temperature change

周围环境温度 Ambient temperature	+40℃	+45℃	+50℃	+55℃	+60℃
Inm=1600A	1.0Inm	0.99Inm	0.96Inm	0.90Inm	0.87Inm
Inm=2500A	1.0Inm	0.96Inm	0.90Inm	0.86Inm	0.82Inm
Inm=4000A	1.0Inm	0.94Inm	0.88Inm	0.83Inm	0.76Inm
Inm=7500A	1.0Inm	0.92Inm	0.86Inm	0.80Inm	0.74Inm

高海拔降容系数表 High altitude derating coefficient table

海拔高度(m) Altitude	2000	3000	4000	5000
工频耐压(V) Power frequency withstand voltage	3500	3000	2500	2000
工作电流修正系数 Correction factor of working current	1	0.94	0.88	0.82
断路器分断能力修正系数 Breaking capacity and correction factor of circuit breaker	1	0.84	0.72	0.66

电源连接 Power connection

1 端子出厂力矩16NM 1 Terminal factory torque 16NM
2 断路器端子 2 Circuit breaker terminal
3 母排 3 Busbar
4 螺栓 4 Bolt
5 垫片 5 Gasket
6 螺母 6 Nut

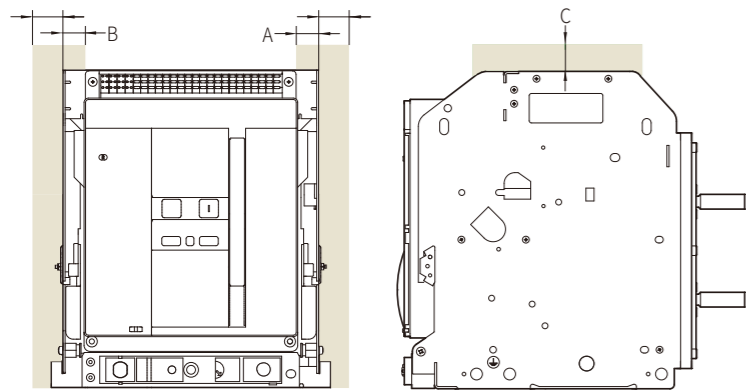
固定 Fixation
母排正确的固定取决于螺栓与螺母适当的力矩。力矩过大或过小都不允许。
对于断路器母排连接，紧固力矩见下表：这些数值适用于铜母排及钢螺栓及螺母。等级8.8。
Proper fixation of the busbar depends on the proper torque of bolts and nuts. Too much or too little torque is not allowed.
For the circuit breaker busbar connection, the tightening torque is shown in the following table: these values are suitable for copper busbars and steel bolts and nuts. Grade 8.8.

举例 For example

紧固力矩 Tightening Torque		紧固力矩 Tightening Torque	
标称(mm) Nominal	钻孔(mm) Drill hole	用弹簧垫圈或平垫圈 Spring washer or flat washer	用接触垫圈或波纹垫圈 Contact washer or corrugated washer
12	13	50	75
10	11	37.5	50

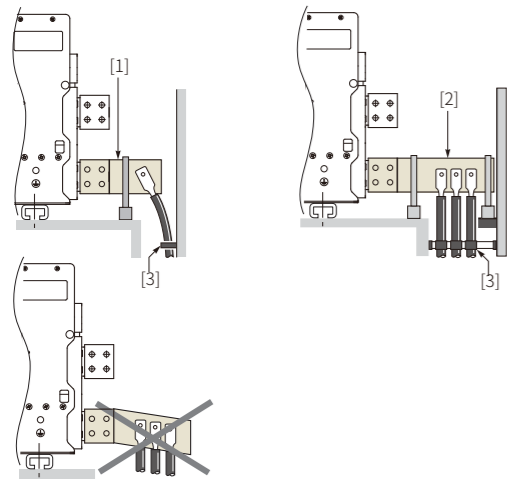
安装尺寸
Dimensions installation

断路器安装安全间隙 Breaker installation safety clearance



		绝缘部分	金属部分	带电部分
抽屜式	A	10	10	30
	B	0	0	30
	C	0	0	30
固定式	A	0	0	60
	B	-	-	-
	C	0	0	100

电缆连接 Cable connection



采用电缆连接需保证其重量不是由断路器端子支撑，而是由面板结构支撑。为此采用如下方式：

使用推荐类型的电源连接端子延伸断路器的接线端：

- 对于单芯电缆，使用方案[1]
- 对于多芯电缆，使用方案[2]

通常可按照以下规则连接到母排：

- 插入螺栓前定位电缆接线片
- 电缆应牢固地固定在配电柜柜架上[3]

The cable connection must ensure that its weight is not supported by the circuit breaker terminals, but by the panel structure.

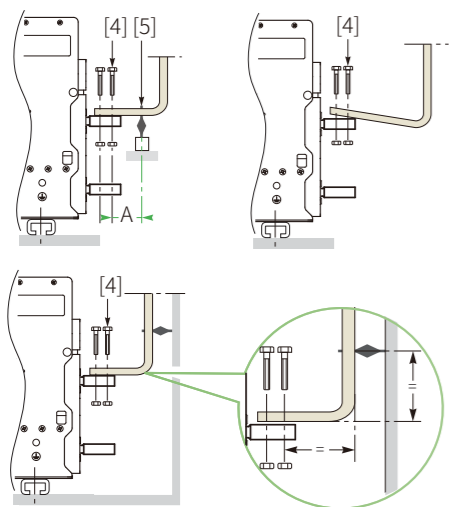
For this purpose, the following methods are adopted:

- For single-core cables, adopt Scheme [1]
- For multi-core cables, adopt Scheme [2]

Usually, the busbar can be connected according to the following rules:

- The cable lug shall be positioned before inserting the bolt
- The cable shall be firmly fixed on the frame of the power distribution cabinet [3]

母排连接 Busbar connection



第一个支撑杆与断路器连接的最大距离A对应预期短路电流值。
The maximum distance A between the first support rod and the circuit breaker corresponds to the expected short-circuit current value.

Isc(kA)	距离 A(mm)
30	350
50	300
65	250
80	150
100	150
150	150

- 断路器母排必须进行适当的调整以确保在螺栓[4]插入前连接点电位在电源端子上。
- 母排的重量需要由配电柜柜架上的母排支架来支撑[5]，而不是断路器的电源端子。

- The circuit breaker busbar must be properly adjusted to ensure that the potential of the connection point is on the power end before the bolt [4] is inserted.
- The weight of the busbar needs to be supported by the busbar bracket on the power distribution cabinet frame [5], not by the power terminal of the circuit breaker.

电动应力 Electrical stress

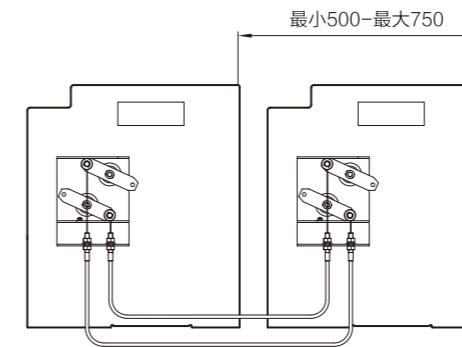
第一个母排支撑杆应在离断路器电源端子的最大距离(A)内。这个距离应能保证母排可以承受短路事件中的相间的电动应力。上表给出了根据短路电流对应的最大距离(A)。

The first busbar support rod shall remain within the maximum distance (A) from the power end of the circuit breaker. The distance shall be able to ensure that the busbar can withstand the electrical stress between phases in a short circuit event. The above table shows the maximum distance (A) corresponding to the short-circuit current.

机械连锁 Mechanical interlocking

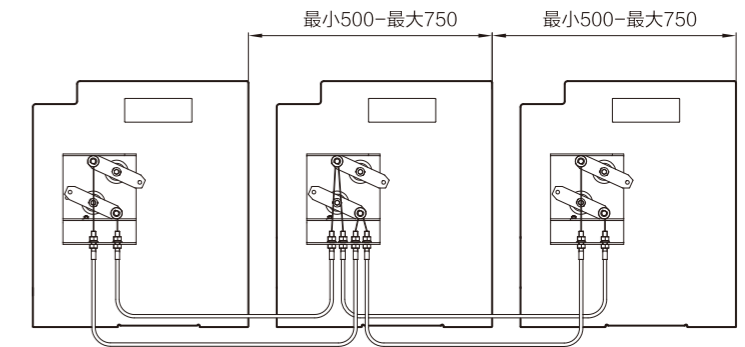
两台断路器横向安装

Two circuit breakers installed horizontally



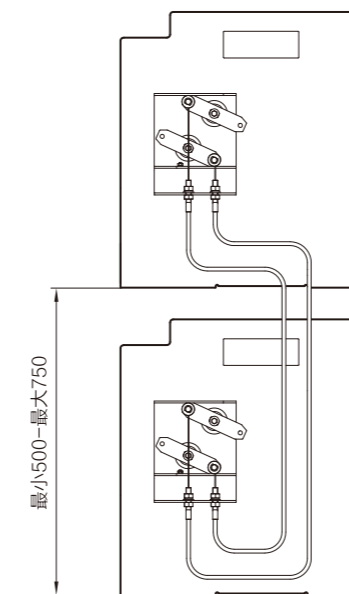
三台断路器横向安装

Three circuit breakers installed horizontally



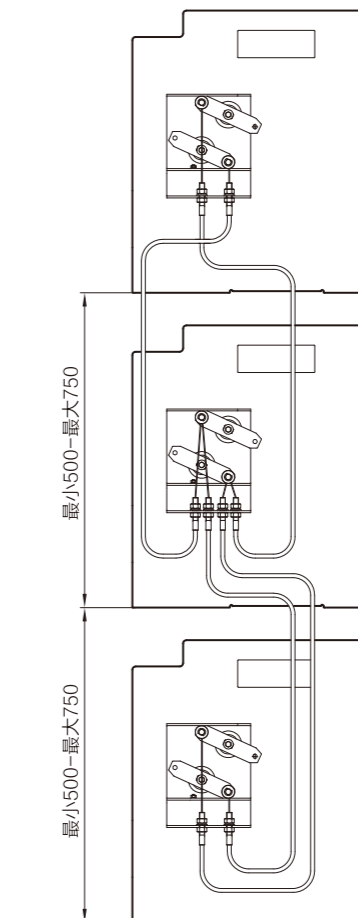
两台断路器纵向安装

Two circuit breakers mounted longitudinally



三台断路器纵向安装

Three circuit breakers mounted longitudinally



KFW5

电气线路图

ELECTRICAL CIRCUIT DIAGRAM

KFW5-1600 二次接线端子 KFW5-1600 secondary wiring terminal	D-1
KFW5-1600 ETU线路图 KFW5-1600 ETU circuit diagram	D-2
KFW5-1600 远程操作 KFW5-1600 remote operation	D-3
KFW5-1600 信号触头 KFW5-1600 signal contact	D-4
KFW5-1600 双电源系统线路图 KFW5-1600 circuit diagram of dual power supply system	D-5
KFW5-1600 外挂四常开四常闭触头接线方案 KFW5-1600 wiring scheme of external four normally open and four normally closed contacts	D-6
KFW5-2500/4000/7500 二次接线端子 KFW5-2500/4000/7500 secondary wiring terminal	D-7
KFW5-2500/4000/7500 ETU线路图 KFW5-2500/4000/7500 ETU circuit diagram	D-8
KFW5-2500/4000/7500 远程操作 KFW5-2500/4000/7500 remote operation	D-9
KFW5-2500/4000/7500 信号触头 KFW5-2500/4000/7500 signal contact	D-10
KFW5-2500/4000/7500 双电源系统线路图 KFW5-2500/4000/7500 circuit diagram of dual power supply system	D-11

电路图是电路不通电的情况下，显示部件打开，连接，储能和继电器处于正常位置

The circuit diagram shows that the display components are on and connected and the stored energy and relay remain in the normal position when the circuit is not powered on.

1

2

3

1	2	3	4	5	20	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51
---	---	---	---	---	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----

----- 仅固定式A3
Fixed A3 only

1	2	7	8	13	14	19	22	25	28	31	34	37	40	43	46	49	52	55
3	4	9	10	15	16	20	23	26	29	32	35	38	41	44	47	50	53	56
5	6	11	12	17	18	21	24	27	30	33	36	39	42	45	48	51	54	57

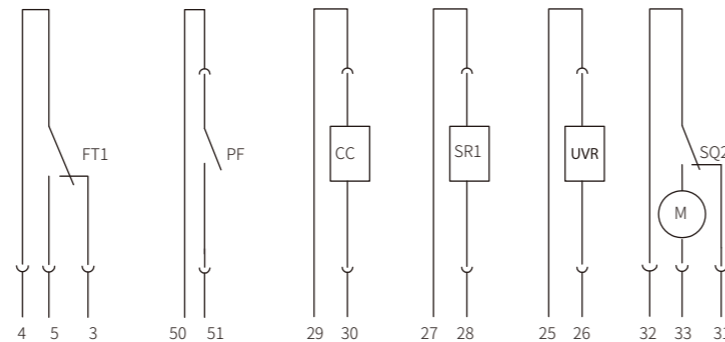
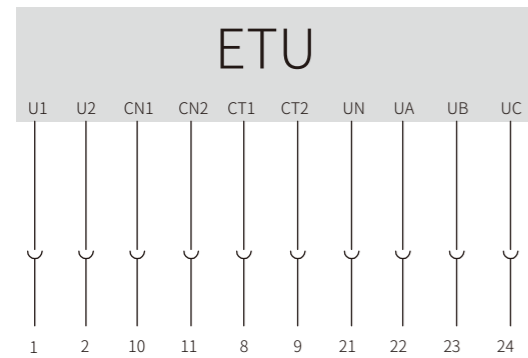
- 1, 2: DC 24V (U1, U2)
3, 4, 5: 故障脱扣指示触点 (FT1)
Fault trip signal indicating contact (FT1)
8, 9: 外部互感器输入端 (CT1, CT2)
External transformer input terminals (CT1, CT2)
10, 11: 通信端子 Communication terminal
12-19: DI、DO触点 (触点功能见D12页触点功能介绍)
DI and DO contacts (see contact functions on Page D12)

- 20: 保护接地线 (PE)
Protective earthing wire (PE)
21, 22, 23, 24: 电压信号 (UN, UA, UB, UC)
Voltage signals (UN, UA, UB, UC)
25, 26: 欠压 (UVR) Undervoltage (UVR)
27, 28: 分励 (SR1) Shunt (SR1)
29, 30: 闭合 (CC) Closed (CC)
31, 32, 33: 电机 (M) Motor (M)

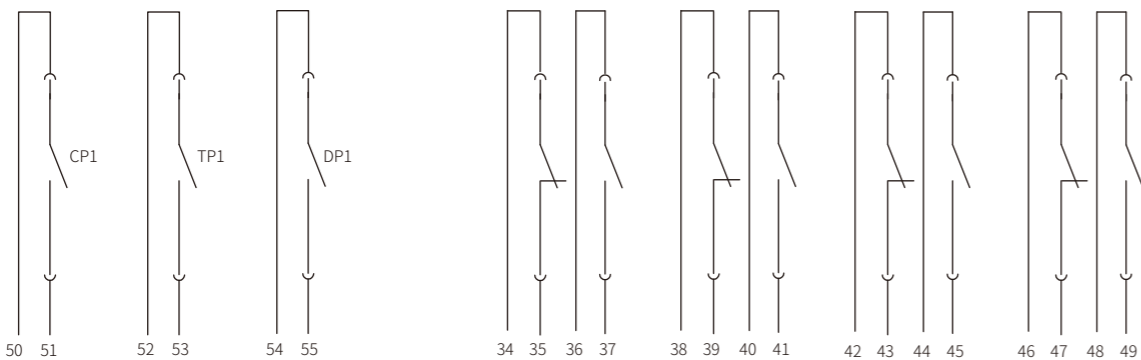
- 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49: 4NO和4NC辅助触点
4NO and 4NC auxiliary contacts
56, 57: 合闸准备就绪触点 (PF) Closing ready contact (PF)
50, 51: 连接 (CP1) Connection (CP1)
52, 53: 试验 (TP1) Test (TP1)
54, 55: 分离 (DP1) Separation (DP1)

1

2



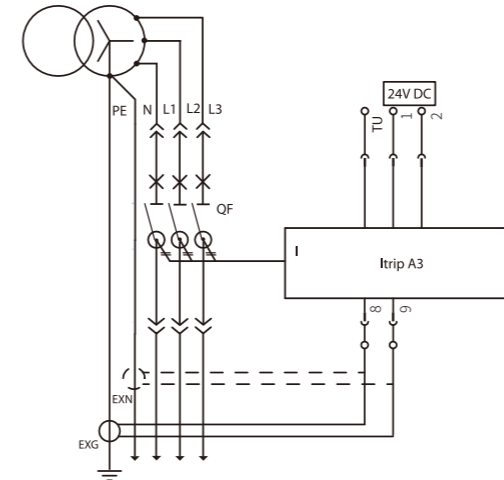
3



电气线路图适用于以下条件 The electrical circuit diagram applies to the following conditions

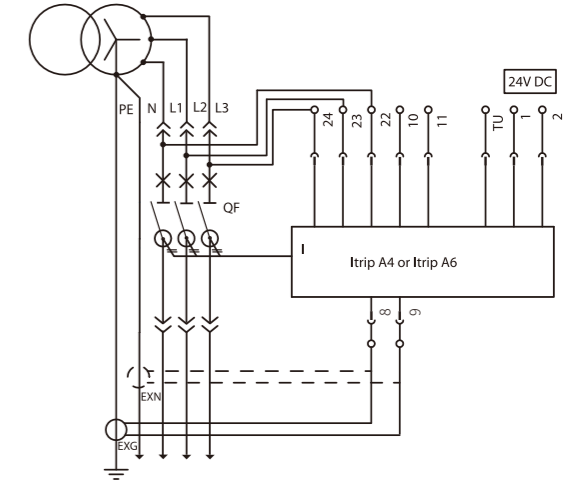
抽屉式断路器的分闸和插入；固定式断路器分闸；脱扣器未脱扣。
Opening and closing of drawer type circuit breakers; opening of fixed circuit breakers; the trip unit is not released.

配有 Itrip A3 电子脱扣器的 3 极断路器
3-pole circuit breaker with Itrip A3 electronic trip unit



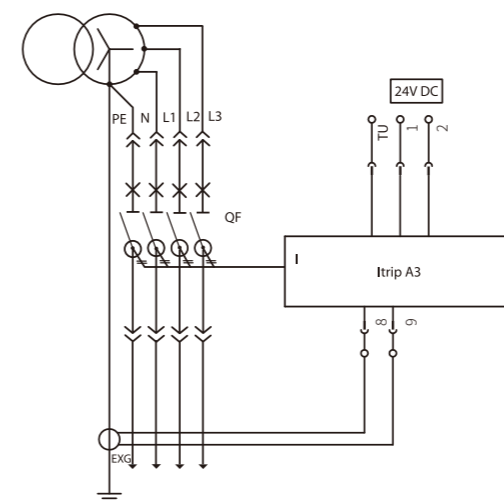
外接 N 相电流互感器(EXN)用于中性线保护
外接接地互感器(EXG)用于接地故障保护
两项保护功能可任选一项进行保护接线
External N-phase current transformer (EXN) for neutral line protection
External grounding transformer (EXG) for ground fault protection
Either of the two protection functions for protective wiring

配有 Itrip A4 或A6电子脱扣器的 3 极断路器
3-pole circuit breaker with Itrip A4 or A6 electronic trip unit



外接 N 相电流互感器(EXN)用于中性线保护
外接接地互感器(EXG)用于接地故障保护
两项保护功能可任选一项进行保护接线
External N-phase current transformer (EXN) for neutral line protection
External grounding transformer (EXG) for ground fault protection
Either of the two protection functions for protective wiring

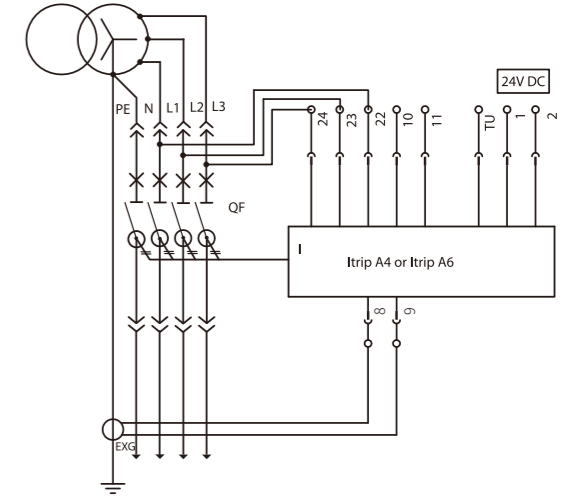
配有 Itrip A3 电子脱扣器的 4 极断路器
4-pole circuit breaker with Itrip A3 electronic trip unit



外接接地互感器(EXG)用于接地故障保护
External grounding transformer (EXG) for ground fault protection

- EXG: 外接接地互感器
EXN: 外接 N 相电流互感器
QF: 空气断路器
TU: 脱扣线圈
8, 9: 外接接地互感器输入/外接 N 相电流互感器输入
1, 2: 外接 24V DC 输入
22, 23, 24: 测量电压输入
10, 11: 通信端子输入

配有 Itrip A4 或A6电子脱扣器的 4 极断路器
4-pole circuit breaker with Itrip A4 or A6 electronic trip unit



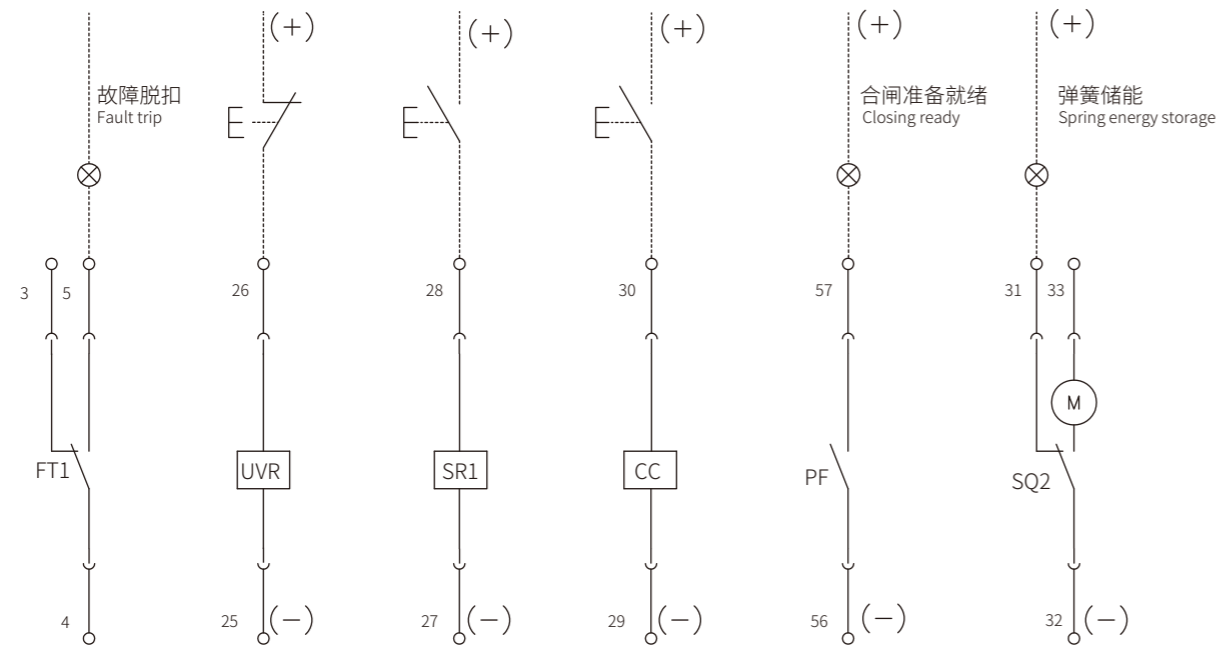
外接接地互感器(EXG)用于接地故障保护
External grounding transformer (EXG) for ground fault protection

- EXG: External grounding transformer
EXN: External N-phase current transformer
QF: Air circuit breaker
TU: Tripping coil
8, 9: External grounding transformer input/external N-phase current transformer input
1, 2: External 24VDC input
22, 23, 24: Measure voltage input
10, 11: Communication terminal input

远程操作 Remote operation

电气线路图适用于以下条件：
The electrical circuit diagram applies to the following conditions

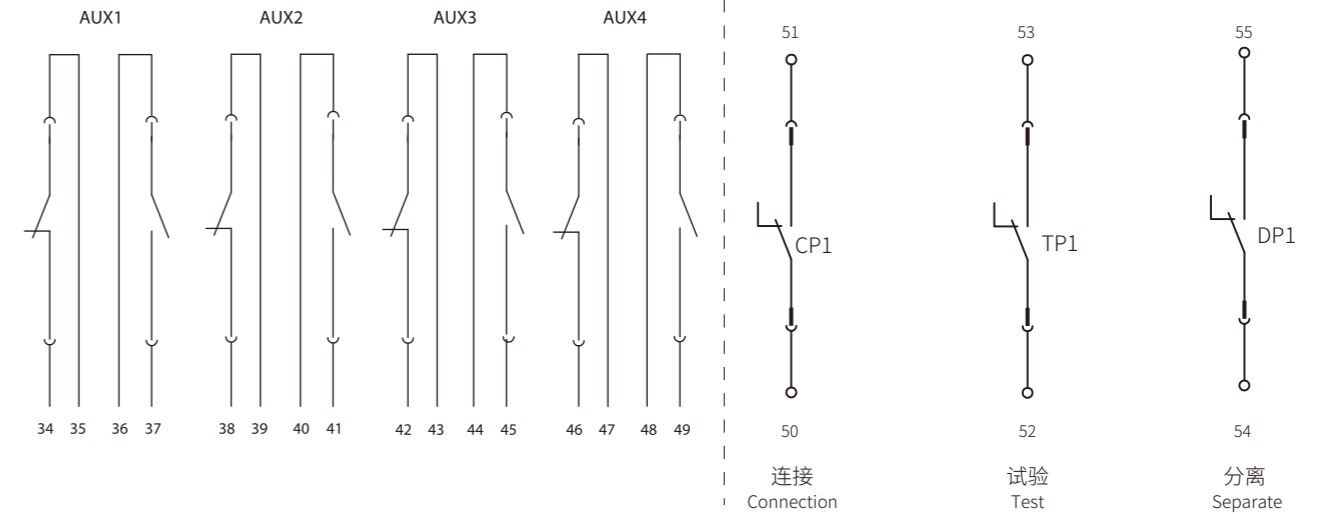
- 合闸弹簧已储能
The closing spring has been charged
- 脱扣器未脱扣
The trip unit is not released



FT1: 故障脱扣指示触点 3, 4, 5: FT1 输入	FT1: Fault trip signal indicating contact 3, 4, 5: FT1 input	CC: 合闸线圈 29, 30: 合闸线圈输入	CC: Closing coil 29, 30: Closing coil input
UVR: 欠压脱扣器 25, 26: UVR 输入	UVR: Undervoltage release 25, 26: UVR input	PF: 合闸准备就绪指示触点 56, 57: PF 输入	PF: Closing ready indicating contact 56, 57: PF input
SR1: 分励脱扣器 27, 28: SR1 输入	SR1: Shunt release 27, 28: SR1 input	SQ2: 弹簧储能指示触点 M: 弹簧储能电机 31, 32: 弹簧储能指示输出 32, 33: M 输入	SQ2: Spring energy storage indication contact M: Spring energy stored motor 31, 32: Spring energy storage indication output 32, 33: M input

辅助触点 Auxiliary contact

位置指示触点 Position indication contact



AUX1, AUX2, AUX3, AUX4: 4NO/4NC 辅助触点
CP1: 连接位置指示触点
TP1: 试验位置指示触点
DP1: 分离位置指示触点

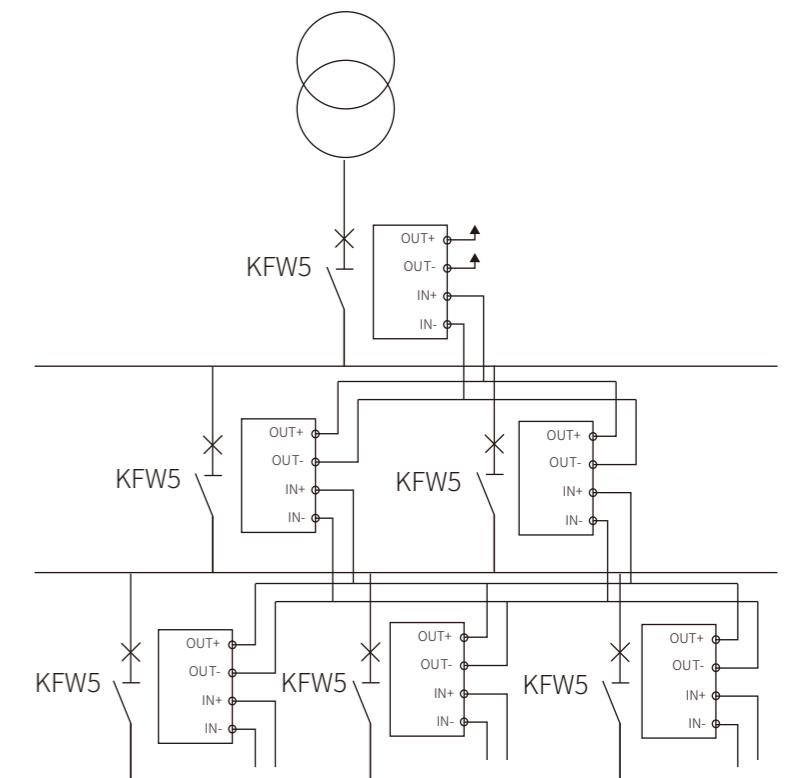
AUX1, AUX2, AUX3, AUX4: 4NO and 4NC auxiliary contacts
CP1: Connecting position indicating contact
TP1: Testing position indicating contact
DP1: Separation position indicating contact

用于 S 和 G 保护的区域选择性联锁

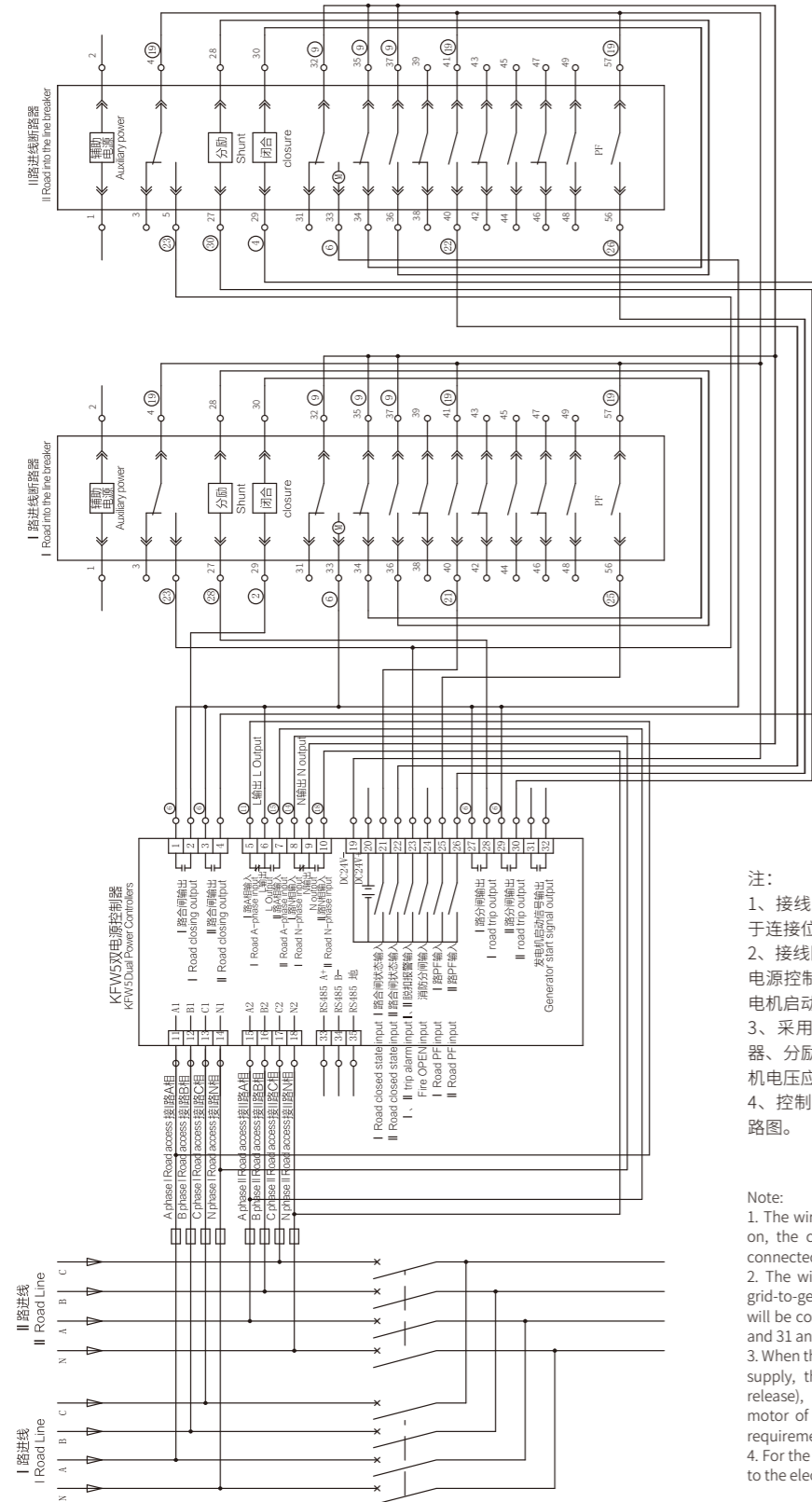
区域选择性联锁 (ZSI) 用于 S 和 G 保护, 通过 DI/DO 模块, 将下游断路器的输出端与上游断路器的输入端连接。当下游断路器的电子脱扣器由于短路故障被激活, ZSI 功能使得该电子脱扣器向上游断路器发送一个信号, 上游断路器收到信号后暂时封锁, 下游断路器执行脱扣, 故障便能在设置的延迟时间内被清除。

Regional selective interlocking for S and G protection

Regional selective interlocking (ZSI) is used for S and G protection. The output end of downstream circuit breaker is connected with the input end of upstream circuit breaker by means of DI/DO module. When the electronic release of the downstream circuit breaker is activated due to a short circuit fault, the ZSI will enable the electronic release to send a signal to the upstream circuit breaker. The upstream circuit breaker will be temporarily blocked after receiving the signal, while the downstream circuit breaker will perform a trip, so that the fault can be cleared within the set delay time.



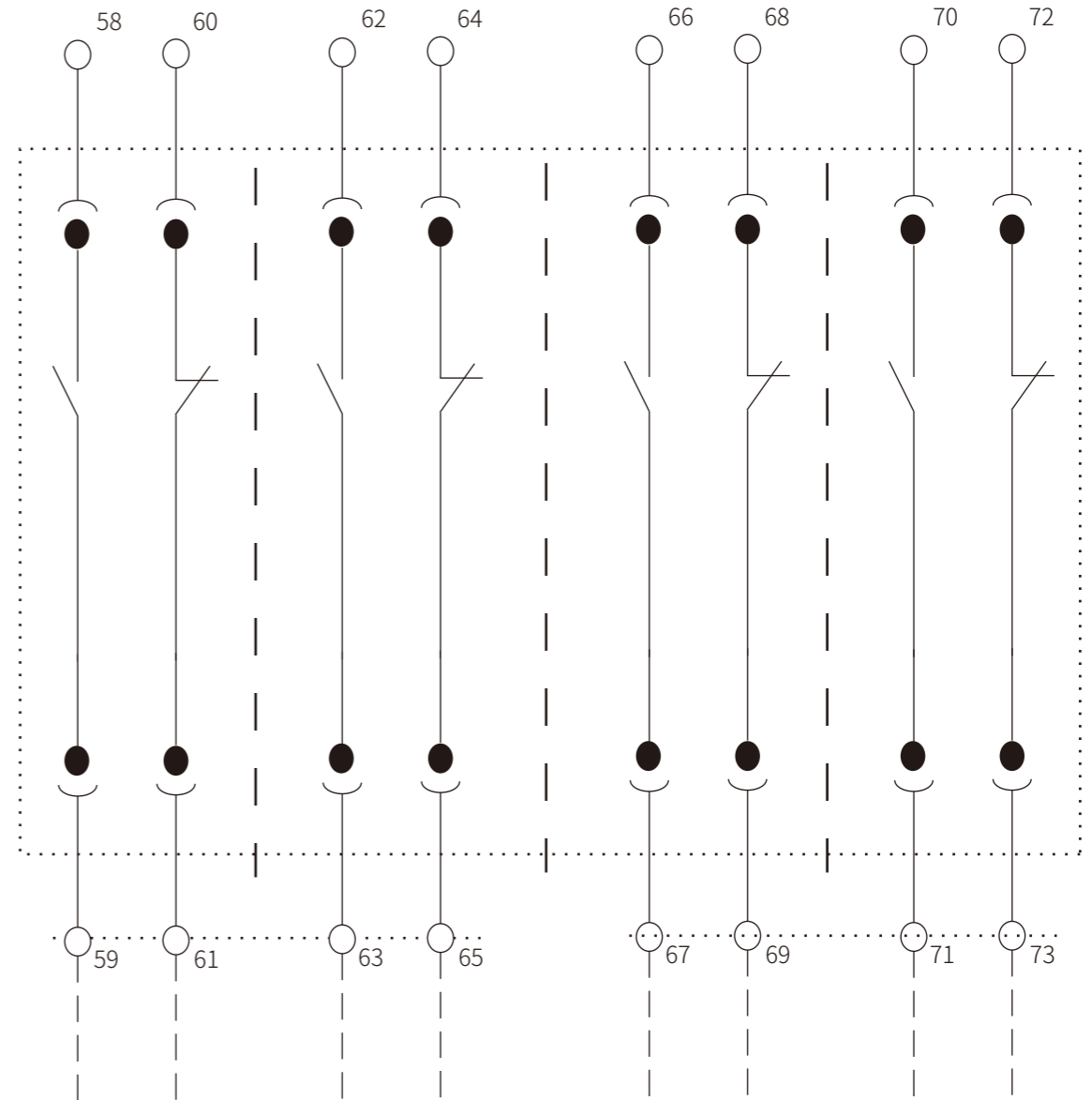
双电源自动转换系统电气接线图 Electrical Wiring Diagram of Dual Power Automatic Conversion System



- 注:
- 1、接线图指示为网路无电，断路器处于分闸状态，并处于连接位置，机构已储能。
 - 2、接线图为电网-电网系统，若为电网-发电机系统，双电源控制器19号接DC24V-，20号接DC24V+，31、32为发电机启动信号输出。
 - 3、采用自动电源转换系统供电时，断路器的智能控制器、分励（分励脱扣器）、闭合（合闸电磁铁）、储能电机电压应为AC230V，有其他电源要求需事先说明。
 - 4、控制器1、2号端子接线参照KFW5系列断路器电气线路图。

- Note:
1. The wiring diagram indicates that the network is not powered on, the circuit breaker remains in the open state and in the connected position, and the mechanism has been charged.
 2. The wiring diagram indicates a grid-to-grid system. If it is a grid-to-generator system, the dual power supply controller No.19 will be connected to DC24V-, No.20 will be connected to DC24V+, and 31 and 32 will be the generator start signal output.
 3. When the automatic power conversion system is used for power supply, the voltage of the intelligent controller, shunt (shunt release), closing (closing electromagnet) and energy storage motor of the circuit breaker shall be AC230V, and other power requirements need to be stated in advance.
 4. For the wiring of No.1 and No.2 terminals of the controller, refer to the electrical circuit diagram of KFW5 series circuit breakers.

外挂四常开四常闭触头接线方案 Wiring scheme of external four normally open and four normally closed contacts



- 注:
- 1、可单独提供每组常开常闭触头，最多可提供四常开四常闭。
 - 2、抽屉式断路器，外挂附加触头仅在断路器处于连接位置时，反应开关分、合状态。
- Note:
1. Each set of NO/NC contacts can be provided separately, with a maximum of 4NO/4NC contacts.
 2. For the drawer type circuit breaker, its additional contacts reflect the on-off status of the switch only when the circuit breaker is on.

电路图是电路不通电的情况下，显示部件打开，连接，储能和继电器处于正常位置

The circuit diagram shows that the display components are on and connected and the stored energy and relay remain in the normal position when the circuit is not powered on.

1

2

3

93	94	95	96	1	2	7	8	13	14	19	20	25	28	31	34	37	40	43	46	49	52	55	58	61	64	67	70	73	76	79	82
89	90	91	92	3	4	9	10	15	16	21	22	26	29	32	35	38	41	44	47	50	53	56	59	62	65	68	71	74	77	80	83
85	86	87	88	5	6	11	12	17	18	23	24	27	30	33	36	39	42	45	48	51	54	57	60	63	66	69	72	75	78	81	84

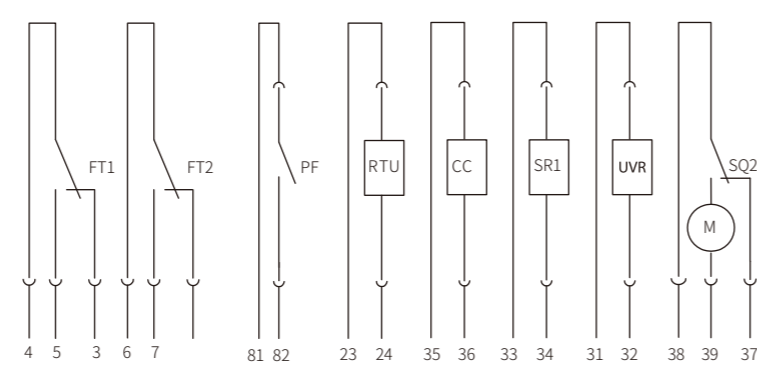
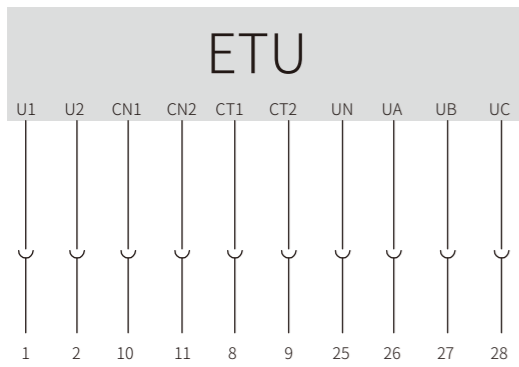
- 1, 2: DC 24V (U1, U2)
- 3, 4, 5: 故障脱扣指示触点 (FT1)
Fault trip signal indicating contact (FT1)
- 6, 7: 故障脱扣指示触点 (FT2)
Fault trip signal indicating contact (FT2)
- 8, 9: 外部互感器输入端 (CT1, CT2)
External transformer input terminals (CT1, CT2)
- 10, 11: 通信端子 Communication terminal
- 12-19: DI, DO触点 (触点功能见D12页触点功能介绍)
DI and DO contacts (see contact functions on Page D12)

- 20: 保护接地线 (PE)
Protective earthing wire (PE)
- 23, 24: 远程复位单元 (RTU)
Remote reset unit (RTU)
- 25, 26, 27, 28: 电压信号 (UN, UA, UB, UC)
Voltage signals (UN, UA, UB, UC)
- 31, 32: 欠压 (UVR) Undervoltage (UVR)
- 33, 34: 分励 (SR1) Shunt (SR1)
- 35, 36: 闭合 (CC) Closed (CC)

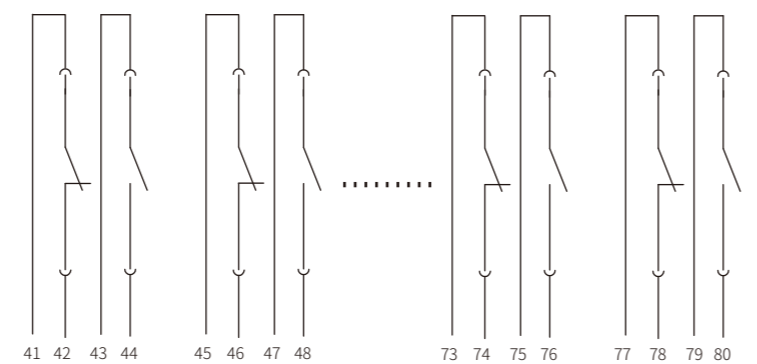
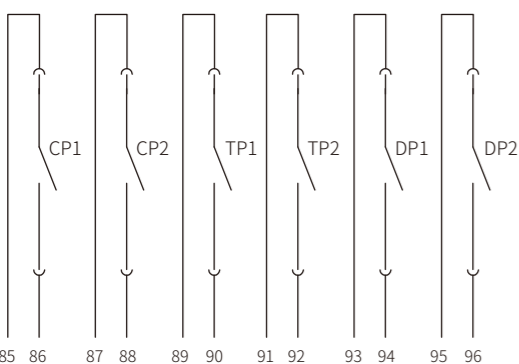
- 37, 38: 弹簧储能指示
Spring energy storage indication
- 38, 39: 电机 (M) Motor (M)
- 41, 42, 43, 44.....77, 78, 79, 80: 10NO和10NC辅助触点
10NO and 10NC auxiliary contacts
- 81, 82: 合闸准备就绪触点 (PF) Closing ready contact (PF)
- 85, 86/87, 88: 连接 (CP1, CP2) Connection (CP1, CP2)
- 89, 90/91, 92: 试验 (TP1, TP2) Test (TP1, TP2)
- 93, 94/95, 96: 分离 (DP1, DP2) Separate (DP1, DP2)

1

2



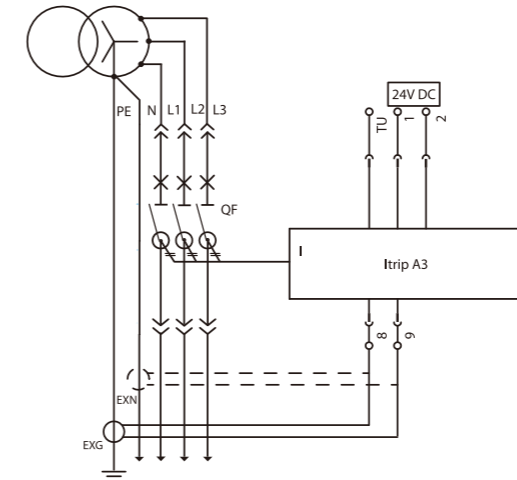
3



电气线路图适用于以下条件 The electrical circuit diagram applies to the following conditions

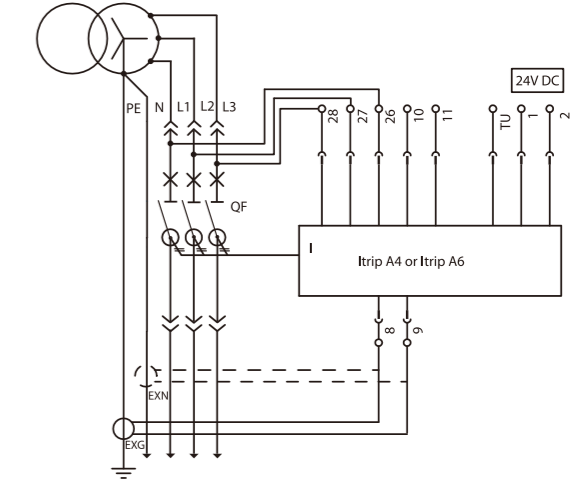
抽屉式断路器的分闸和插入；固定式断路器分闸；脱扣器未脱扣。
Opening and closing of drawer type circuit breakers; opening of fixed circuit breakers; the trip unit is not released.

配有 Itrip A3 电子脱扣器的 3 极断路器
3-pole circuit breaker with Itrip A3 electronic trip unit



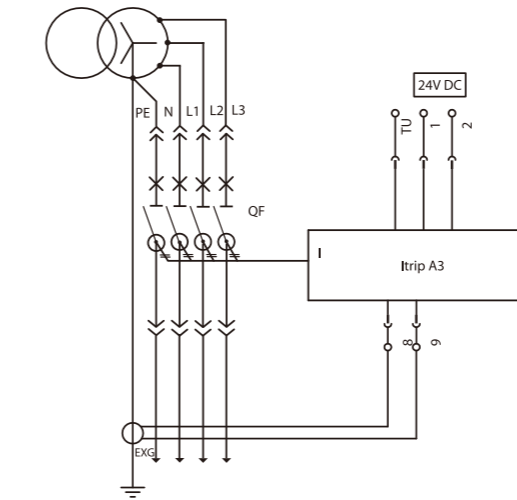
外接 N 相电流互感器(EXN)用于中性线保护
外接接地互感器(EXG)用于接地故障保护
两项保护功能可任选一项进行保护接线
External N-phase current transformer (EXN) for neutral line protection
External grounding transformer (EXG) for ground fault protection
Either of the two protection functions for protective wiring

配有 Itrip A2 或A3电子脱扣器的 3 极断路器
3-pole circuit breaker with Itrip A2 or A3 electronic trip unit



外接 N 相电流互感器(EXN)用于中性线保护
外接接地互感器(EXG)用于接地故障保护
两项保护功能可任选一项进行保护接线
External N-phase current transformer (EXN) for neutral line protection
External grounding transformer (EXG) for ground fault protection
Either of the two protection functions for protective wiring

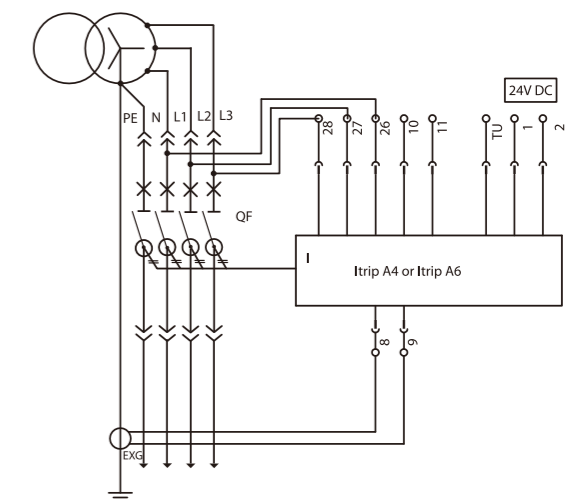
配有 Itrip A3 电子脱扣器的 4 极断路器
4-pole circuit breaker with Itrip A3 electronic trip unit



外接接地互感器(EXG)用于接地故障保护
External grounding transformer (EXG) for ground fault protection

- EXG: 外接接地互感器
- EXN: 外接 N 相电流互感器
- QF: 空气断路器
- TU: 脱扣线圈
- 8, 9: 外接接地互感器输入/外接 N 相电流互感器输入
- 1, 2: 外接 24V DC 输入
- 26, 27, 28: 测量电压输入
- 10, 11: 通信端子输入

配有 Itrip A4 或A6电子脱扣器的 4 极断路器
4-pole circuit breaker with Itrip A4 or A6 electronic trip unit



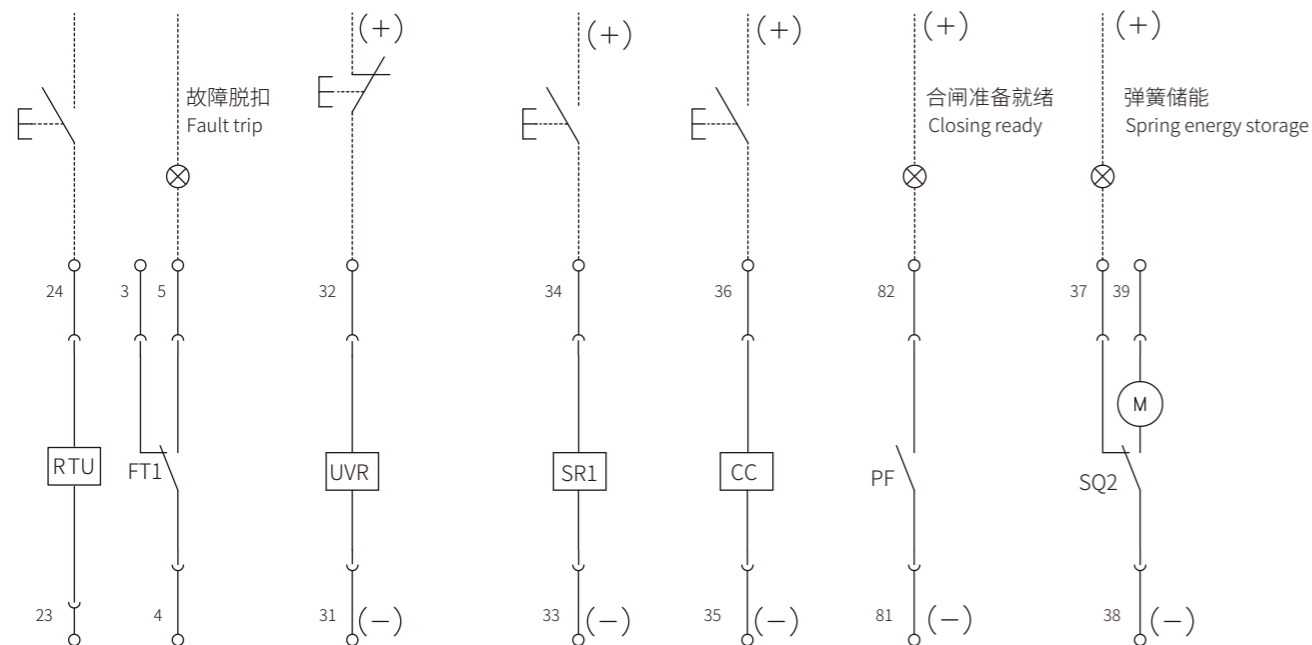
外接接地互感器(EXG)用于接地故障保护
External grounding transformer (EXG) for ground fault protection

- EXG: External grounding transformer
- EXN: External N-phase current transformer
- QF: Air circuit breaker
- TU: Tripping coil
- 8, 9: External grounding transformer input/external N-phase current transformer input
- 1, 2: External 24VDC input
- 22, 23, 24: Measure voltage input
- 10, 11: Communication terminal input

远程操作 Remote operation

电气线路图适用于以下条件：
The electrical circuit diagram applies to the following conditions:

- 合闸弹簧已储能
The closing spring has been charged
- 脱扣器未脱扣
The trip unit is not released



RTU: 远程复位单元
23, 24: RTU 输入
RTU: Remote reset unit
23, 24: RTU input

FT1: 故障脱扣指示触点
3, 4, 5: FT1 输出
FT1: Fault trip signal indicating contact
3, 4, 5: FT1 output

UVR: 欠压脱扣器
31, 32: UVR 输入
UVR: Undervoltage release
31, 32: UVR input

SR1: 分励脱扣器
33, 34: SR1 输入
SR1: Shunt release
33, 34: SR1 input

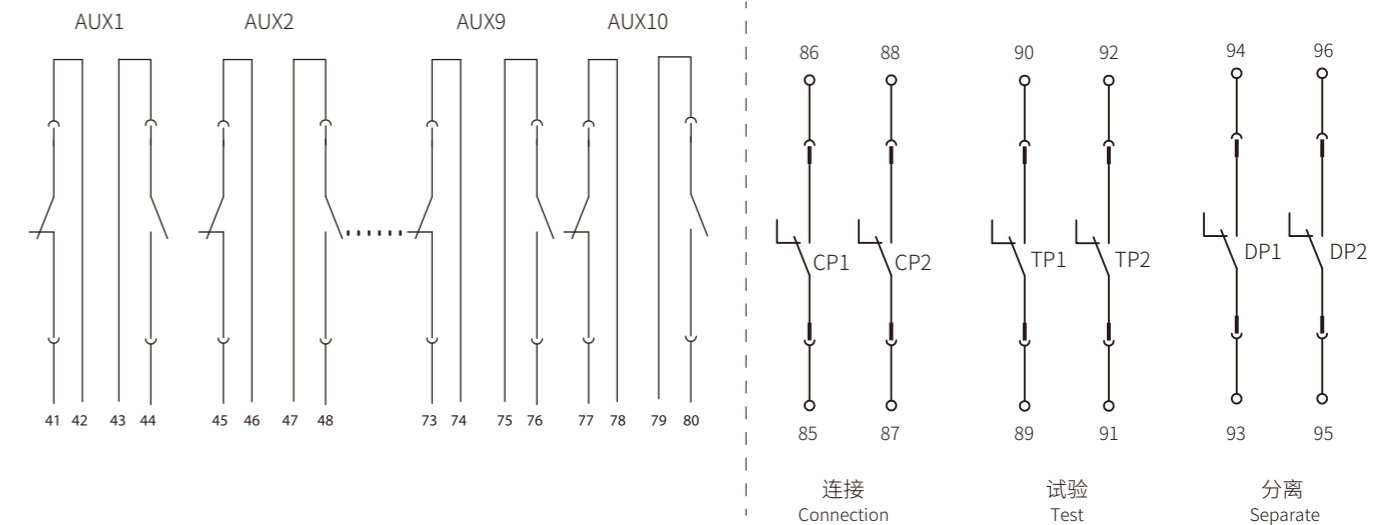
CC: 合闸线圈
35, 36: 合闸线圈输入
CC: Closing coil
35, 36: Closing coil input

PF: 合闸准备就绪指示触点
81, 82: PF 输出
PF: Closing ready indicating contact
81, 82: PF output

SQ2: 弹簧储能指示触点
M: 弹簧储能电机
37, 38: 弹簧储能指示输出
38, 39: M 输入
SQ2: Spring energy storage indication contact
M: Spring energy stored motor
37, 38: Spring energy storage indication output
38, 39: M input

辅助触点 Auxiliary contact

位置指示触点 Position indication contact



AUX1, AUX2.....AUX10: 10NO/10NC 辅助触点
CP1/2: 连接位置指示触点
TP1/2: 试验位置指示触点
DP1/2: 分离位置指示触点

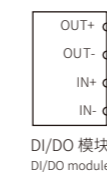
AUX1, AUX2.....AUX10: 10NO/10NC auxiliary contacts
CP1: Connecting position indicating contact
TP1: Testing position indicating contact
DP1: Separation position indicating contact

用于 S 和 G 保护的区域选择性联锁

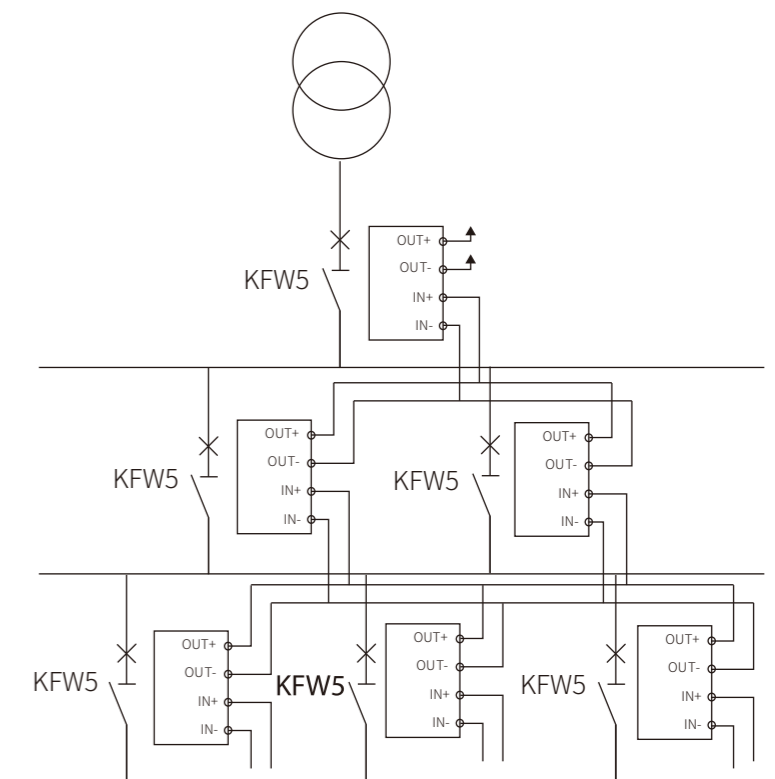
区域选择性联锁 (ZSI) 用于 S 和 G 保护, 通过 DI/DO 模块, 将下游断路器的输出端与上游断路器的输入端连接。当下游断路器的电子脱扣器由于短路故障被激活, ZSI 功能使得该电子脱扣器向上游断路器发送一个信号, 上游断路器收到信号后暂时封锁, 下游断路器执行脱扣, 故障便能在设置的延迟时间内被清除。

Regional selective interlocking for S and G protection

Regional selective interlocking (ZSI) is used for S and G protection. The output end of downstream circuit breaker is connected with the input end of upstream circuit breaker by means of DI/DO module. When the electronic release of the downstream circuit breaker is activated due to a short circuit fault, the ZSI will enable the electronic release to send a signal to the upstream circuit breaker. The upstream circuit breaker will be temporarily blocked after receiving the signal, while the downstream circuit breaker will perform a trip, so that the fault can be cleared within the set delay time.



DI/DO 模块
DI/DO module



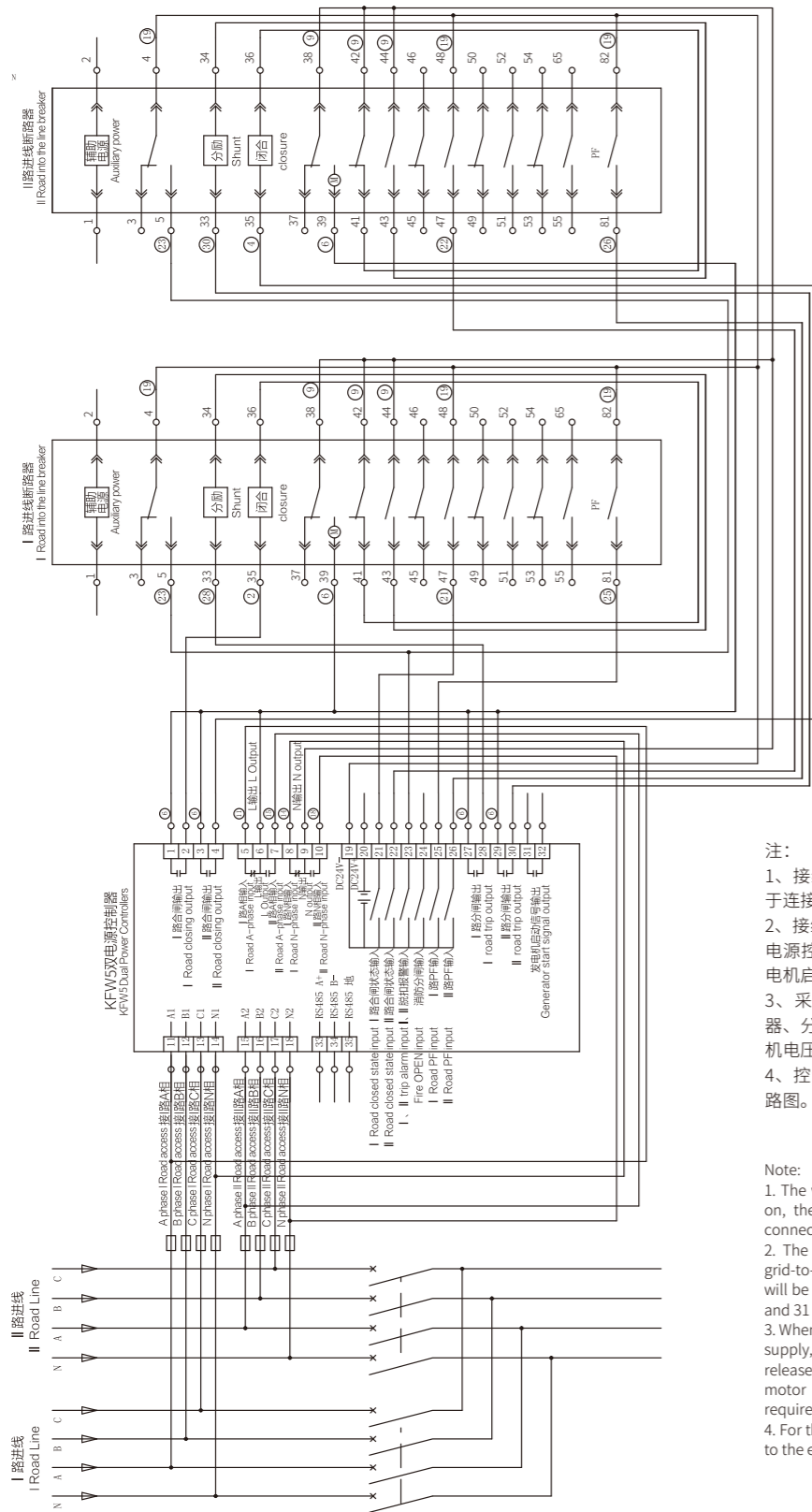
KFW5-2500/4000/7500 双电源系统线路图

KFW5-2500/4000/7500 circuit diagram of dual power supply system

电气接线图

Electrical circuit diagram

双电源自动转换系统电气接线图 Electrical Wiring Diagram of Dual Power Automatic Conversion System



- 注:
- 1、接线图指示为网路无电，断路器处于分闸状态，并处于连接位置，机构已储能。
 - 2、接线图为电网-电网系统，若为电网-发电机系统，双电源控制器19号接DC24V-，20号接DC24V+，31、32为发电机启动信号输出。
 - 3、采用自动电源转换系统供电时，断路器的智能控制器、分励（分励脱扣器）、闭合（合闸电磁铁）、储能电机电压应为AC230V，有其他电源要求需事先说明。
 - 4、控制器1、2号端子接线参照KFW5系列断路器电气线路图。

- Note:
1. The wiring diagram indicates that the network is not powered on, the circuit breaker remains in the open state and in the connected position, and the mechanism has been charged.
 2. The wiring diagram indicates a grid-to-grid system. If it is a grid-to-generator system, the dual power supply controller No.19 will be connected to DC24V-, No.20 will be connected to DC24V+, and 31 and 32 will be the generator start signal output.
 3. When the automatic power conversion system is used for power supply, the voltage of the intelligent controller, shunt (shunt release), closing (closing electromagnet) and energy storage motor of the circuit breaker shall be AC230V, and other power requirements need to be stated in advance.
 4. For the wiring of No.1 and No.2 terminals of the controller, refer to the electrical circuit diagram of KFW5 series circuit breakers.

可编程输入/输出接口 Programmable input / output interface

12~19#: (DO:DC110V/0.5A, AC250V/3A
DI: DC110~130V 或 (or) AC110~AC250V)

当信号单元类型为S1时: (4DO模式) Signal unit type S1: (4DO mode)

12、13#: 可编程输出触点1 (DO1)
14、15#: 可编程输出触点2 (DO2)
16、17#: 可编程输出触点3 (DO3)
18、19#: 可编程输出触点4 (DO4)

12, 13#: Programmable output contact 1 (DO 1)
14, 15#: Programmable output contact 2 (DO 2)
16, 17#: Programmable output contact 3 (DO 3)
18, 19#: Programmable output contact 4 (DO 4)

当信号单元类型为S2: (3DO+1DI模式) Signal unit type S2: (3DO+1DI mode)

12、13#: 可编程输出触点1 (DO1)
14、15#: 可编程输出触点2 (DO2)
16、17#: 可编程输出触点3 (DO3)
18、19#: 可编程开关量输入(DI1)

12, 13#: Programmable output contact 1 (DO 1)
14, 15#: Programmable output contact 2 (DO 2)
16, 17#: Programmable output contact 3 (DO 3)
18, 19#: Programmable switching input (DI 1)

当信号单元类型为S3时: (2DO+2DI模式) Signal unit type S3: (2DO+2DI mode)

12、13#: 可编程输出触点1 (DO1)
14、15#: 可编程输出触点2 (DO2)
16、17#: 可编程开关量输入2(DI2)
18、19#: 可编程开关量输入1(DI1)

12, 13#: Programmable switching contact 1 (DO 1)
14, 15#: Programmable output contact 2 (DO 2)
16, 17#: Programmable switching input 2 (DI 2)
18, 19#: Programmable switching input 1 (DI 1)

DI/DO功能 DI/DO function

DI输入功能 DI input function

当信号单元为S2、S3时，Itrip4/6型控制器
可提供1~2个可编程光隔离开关量输入

For the signal unit S2 or S3, the Itrip4/6 controller can provide 1 to 2 programmable optical isolation switch inputs

开关量输入 (DI) 参数设置表 Switch Input (DI) Parameter Setting

功能设置 Function setting 报警, 跳闸, 区域联锁, 通用, 接地联锁, 短路联锁
Alarm, trip, regional interlocking, universal, grounding interlocking, short circuit interlocking

DI 常开 NO 常闭 NC

DO输出功能 DO output function

智能控制器提供2~4组独立的信号触点输出

The intelligent controller provides 2 to 4 independent signal contact outputs

DO功能设置表 DO Function Setting

功能设置 Function settings 见下表 See table below

DO	常开电平 NO level	常闭电平 NC level	常开脉冲 NO pulse	常闭脉冲 NC pulse
----	---------------	---------------	---------------	---------------

脉冲时间 Pulse time	无 None	1~360s步长1s 1~360s step length of 1s
-----------------	--------	-------------------------------------

可查看当前的I/O状态 Current I/O status can be viewed

DO: "1" 表示输出继电器为闭合状态; "0" 表示输出继电器为断开状态。
DI: "1" 表示动作; "0" 表示复位。(相对与DI执行方式的设置来说)。

DO: "1" indicates the output relay in on state; '0' indicates the output relay in off state
DI: "1" indicates activation; '0' indicates resetting. (Compared to the setting of DI execution mode).

开关量输出(DO)参数设置表 Switch Input (DI) Parameter Setting

通用 Universal	报警 Alarm	故障跳闸 Fault tripping	自诊断报警 Self-diagnosis alarm	负载监控 I Load monitoring I
负载监控 II Load monitoring II	过载预报警 Overload pre-alarm	过载故障 Overload fault	短延时故障 Short-delay fault	瞬时故障 Transient fault
接地/漏电故障 Grounding/leakage fault	接地/漏电报警 Grounding/leakage fault	电流不平衡故障 Current unbalance fault	N相故障 N-phase fault	欠压故障 Undervoltage fault
过压故障 Overvoltage fault	电压不平衡故障 Voltage unbalance fault	欠频故障 Underfrequency fault	过频故障 Overfrequency fault	电流需用值故障 Current required value fault
逆功率故障 Reverse power fault	区域联锁 Regional interlocking	合闸 Closing	分闸 Opening	相序报警 Phase sequence alarm
MCR/HSISC故障 MCR/HSISC fault	接地联锁 Grounding interlocking	短路联锁 Short circuit interlocking	A相需用值故障 A-phase required value fault	B相需用值故障 B-phase required value fault
C相需用值故障 C-phase required value fault	N相需用值故障 N-phase required value fault	需用值超限 Required value out-of-limit		

注:通用是指此输入输出在控制器本身未使用, 可供在通讯组网上由上位计算机操作。

Note: The universal means that the input and output are not used by the controller itself but can be operated by the upper computer on the communication network.

KFW5

特性曲线 CHARACTERISTIC CURVE

Itrip A3 E-1

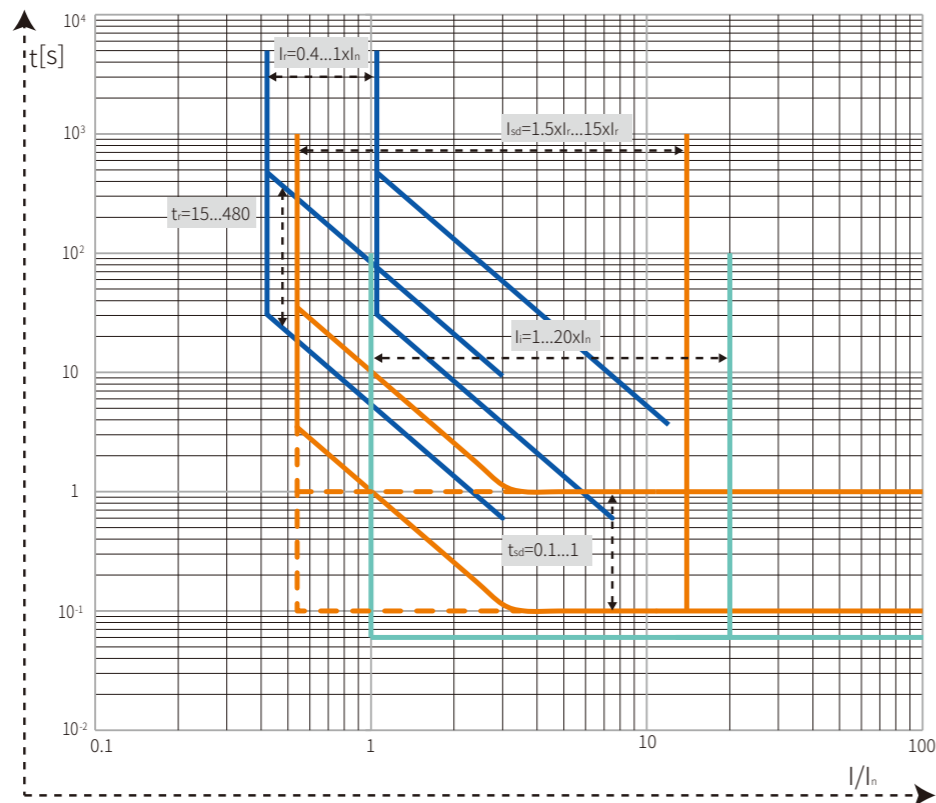
Itrip A4 E-2

Itrip A6 E-5

Itrip A3

特性曲线 Characteristic curve

LSI保护 LSI Protection

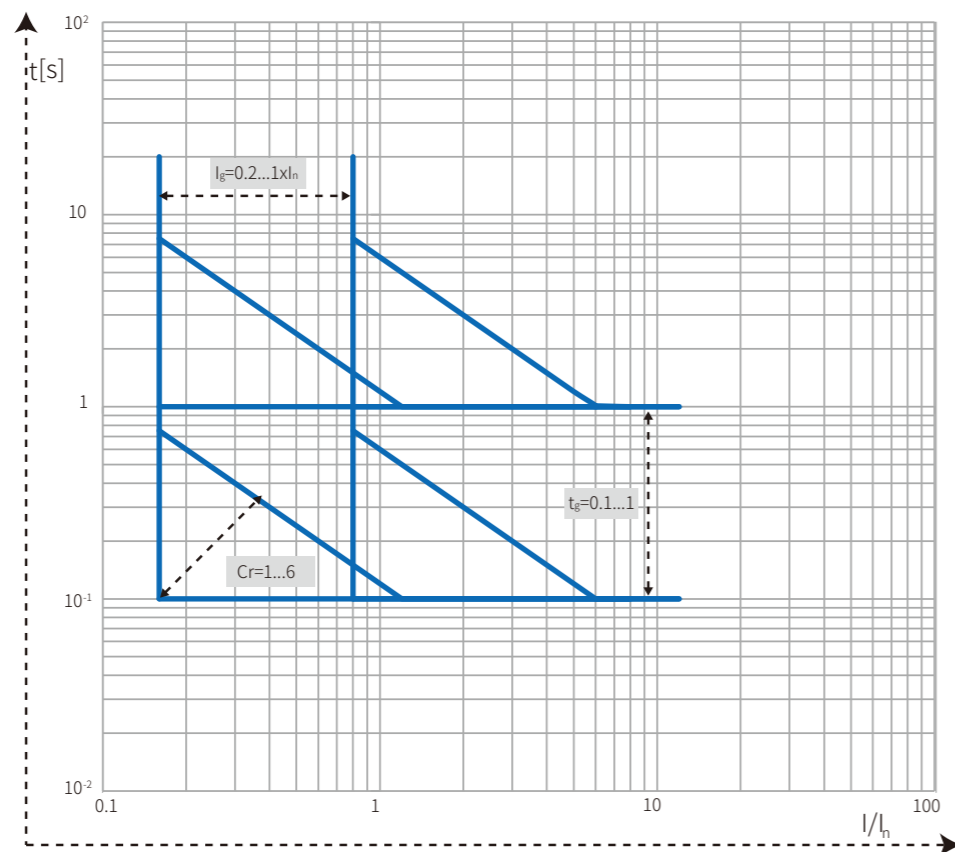


- L 保护
- S 保护 ($I^2t=c$)
- - - S 保护 ($t=c$)
- I 保护

G保护 G Protection

G 保护曲线符合下式:
 $t=C_r \times I_g \times t_g / I$ (当 $I < C_r \times I_g$ 时)
 C_r : 接地故障剪切系数
 I_g : 接地故障整定电流
 t_g : 接地故障整定延时时间

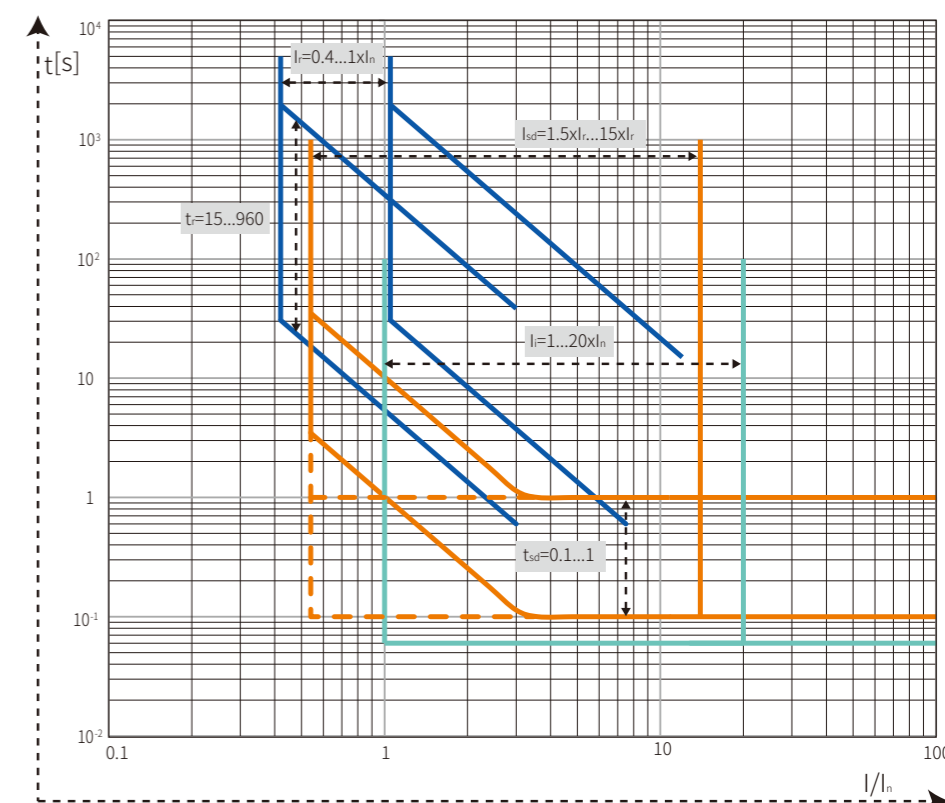
The G protection curve follows the formula below:
 $t=C_r \times I_g \times t_g / I$ ($I < C_r \times I_g$)
 C_r : Ground fault shear coefficient
 I_g : Ground fault setting current
 t_g : Ground fault setting delay time



- G: 接地故障保护

Itrip A4

LSI保护 LSI Protection

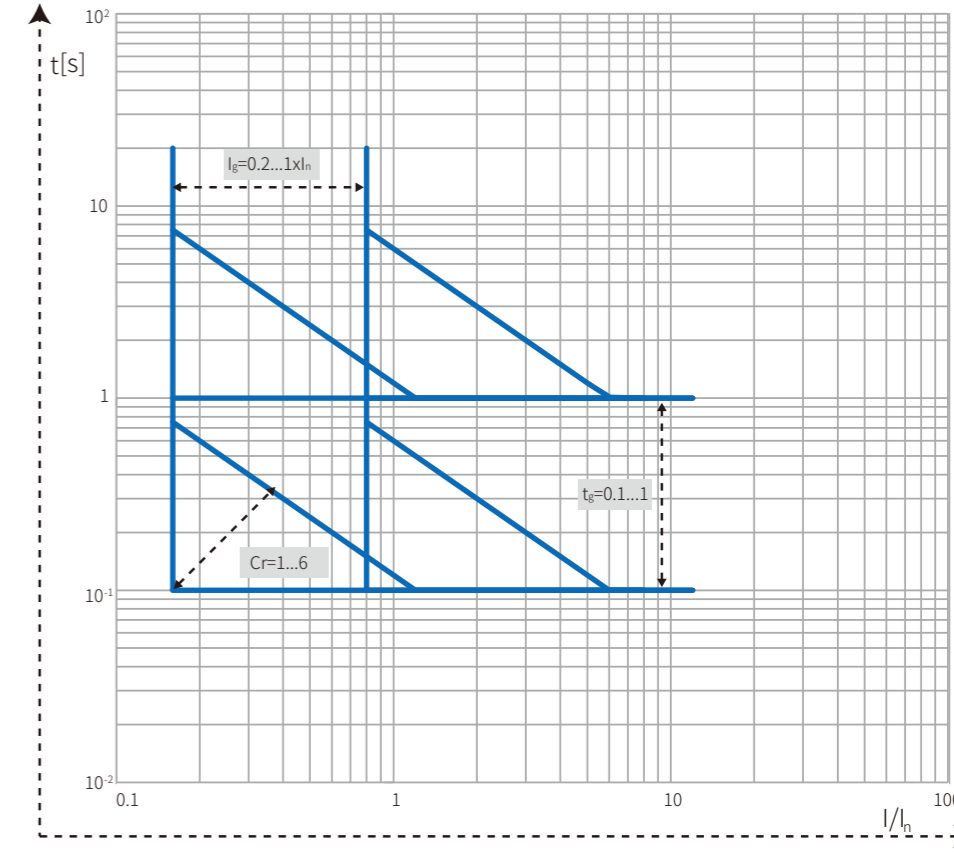


- L 保护
- S 保护 ($I^2t=c$)
- - - S 保护 ($t=c$)
- I 保护

G保护 G Protection

G 保护曲线符合下式:
 $t=C_r \times I_g \times t_g / I$ (当 $I < C_r \times I_g$ 时)
 C_r : 接地故障剪切系数
 I_g : 接地故障整定电流
 t_g : 接地故障整定延时时间

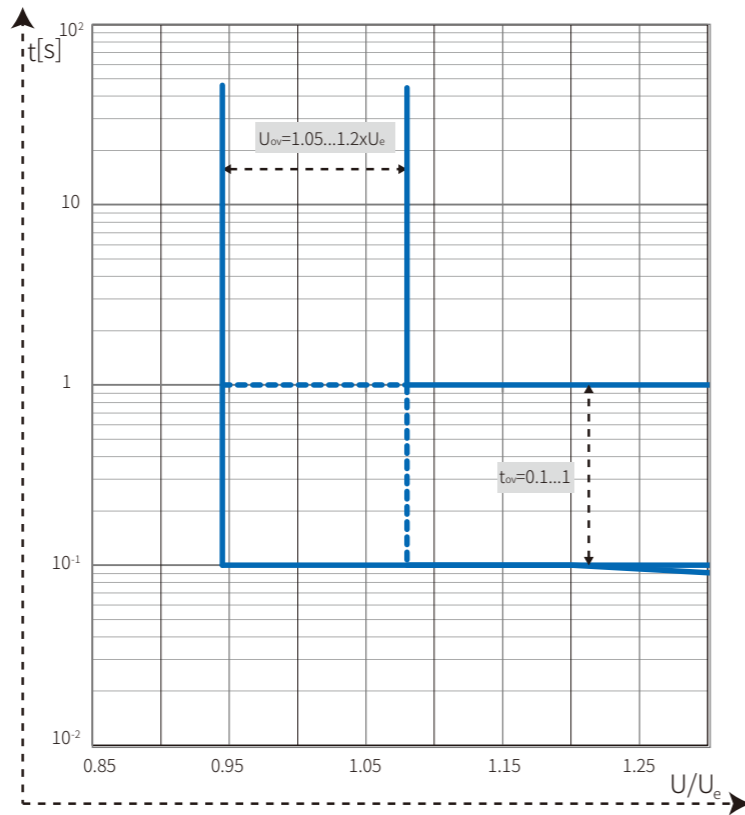
The G protection curve follows the formula below:
 $t=C_r \times I_g \times t_g / I$ ($I < C_r \times I_g$)
 C_r : Ground fault shear coefficient
 I_g : Ground fault setting current
 t_g : Ground fault setting delay time



- G: 接地故障保护

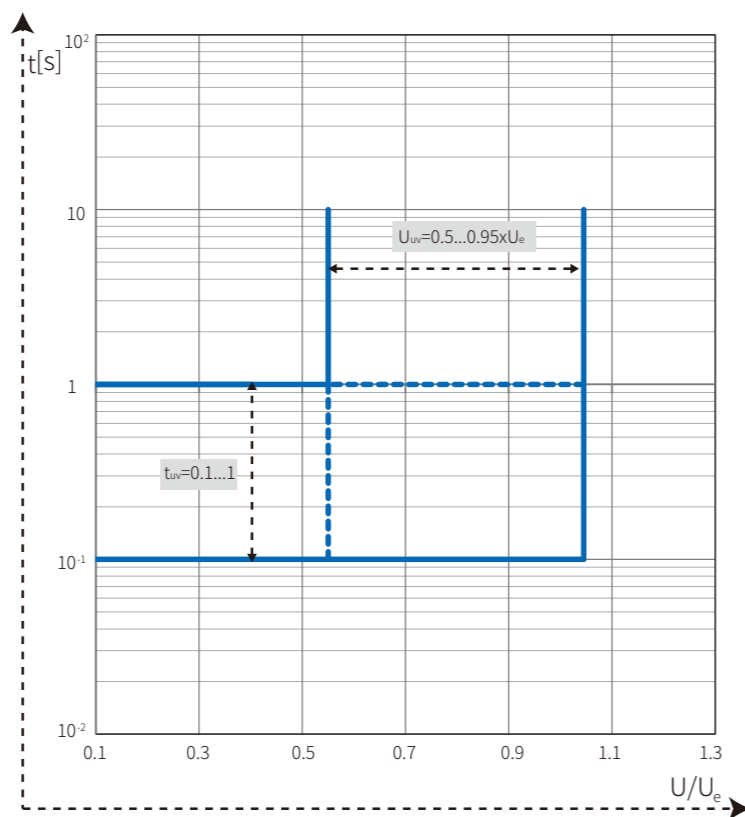
特性曲线
Characteristic curve

OV 保护
OV Protection



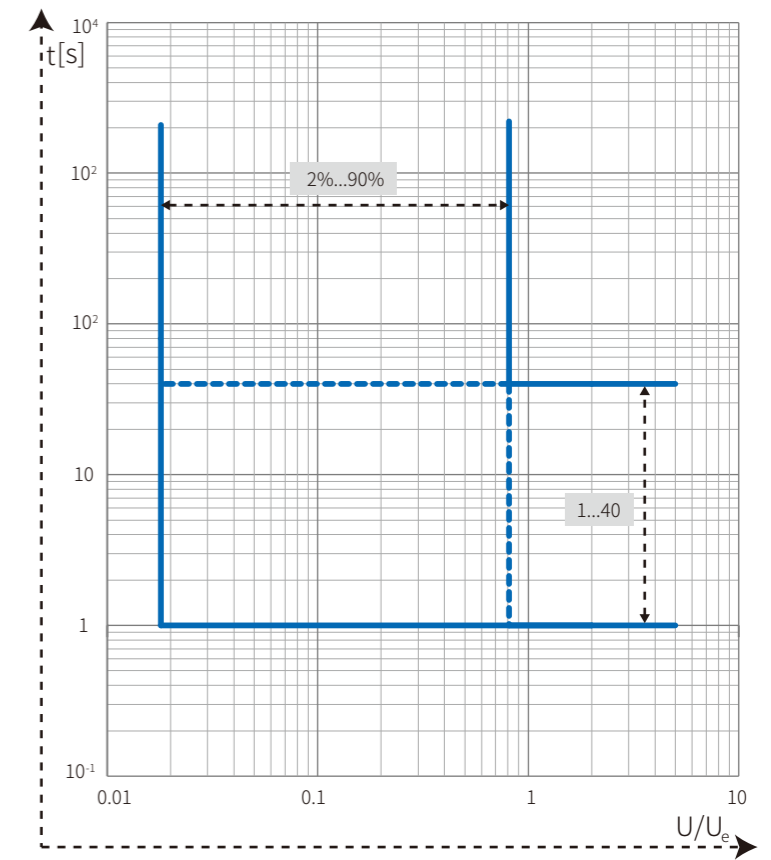
OV: 过压保护
OV: Overvoltage protection

UV 保护
UV Protection



UV: 欠压保护
UV: Undervoltage protection

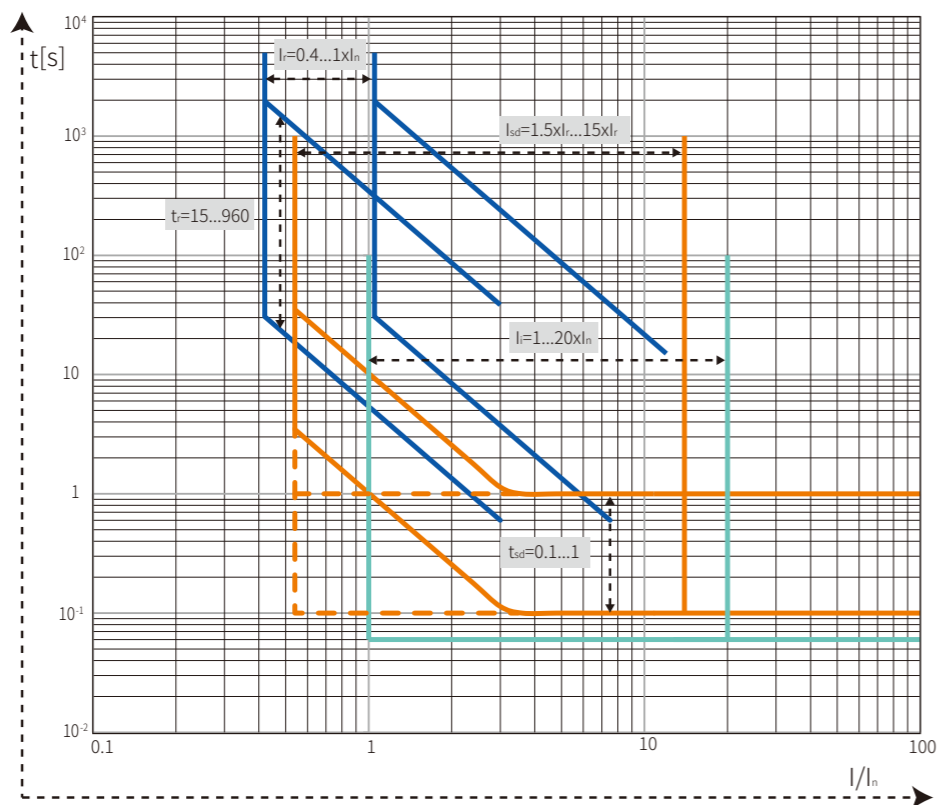
电压不平衡保护
Voltage imbalance protection



相不平衡保护
Phase unbalance protection

特性曲线
Characteristic curve

LSI保护
LSI Protection

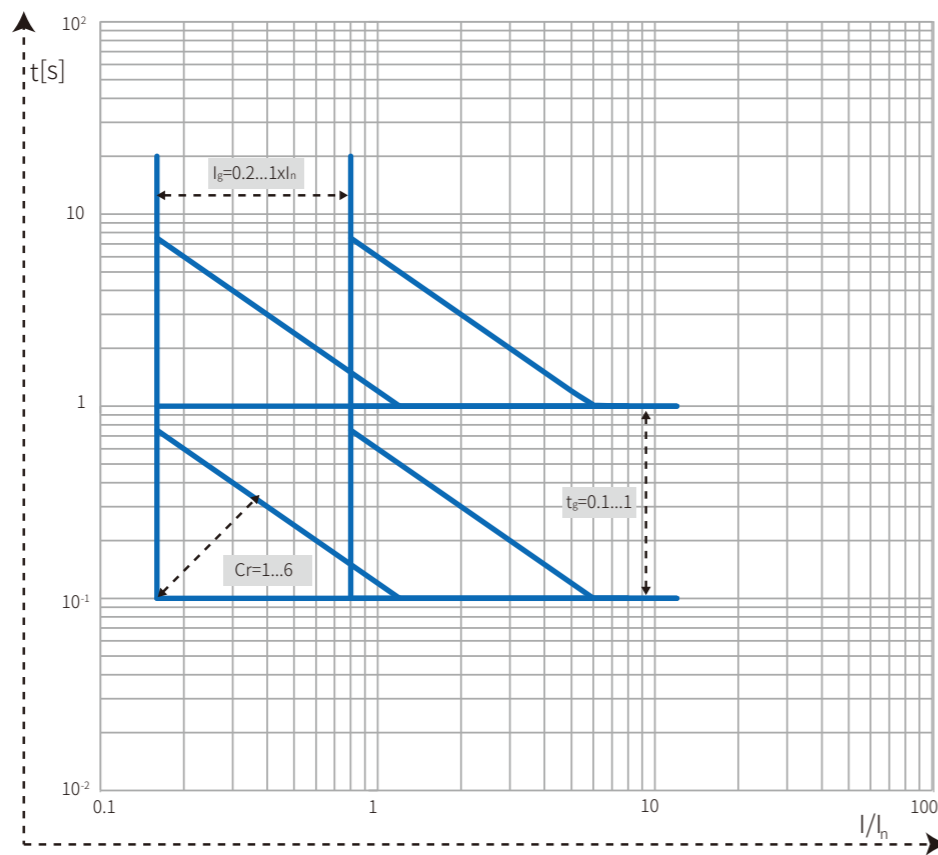


- L 保护
- S 保护 ($I^2t=c$)
- - - S 保护 ($t=c$)
- I 保护

G保护
G Protection

G 保护曲线符合下式:
 $t=C_r \times I_g \times t_{g0} / I$ (当 $I < C_r \times I_g$ 时)
 C_r : 接地故障剪切系数
 I_g : 接地故障整定电流
 t_{g0} : 接地故障整定延时时间

The G protection curve follows the formula below:
 $t=C_r \times I_g \times t_{g0} / I$ ($I < C_r \times I_g$)
 C_r : Ground fault shear coefficient
 I_g : Ground fault setting current
 t_{g0} : Ground fault setting delay time



- G: 接地故障保护
G: Ground fault protection

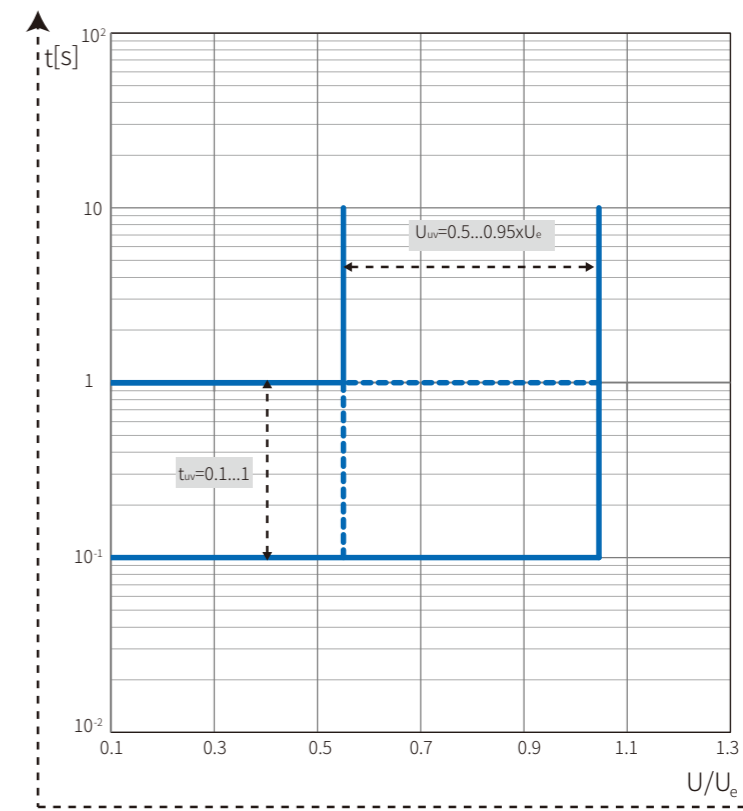
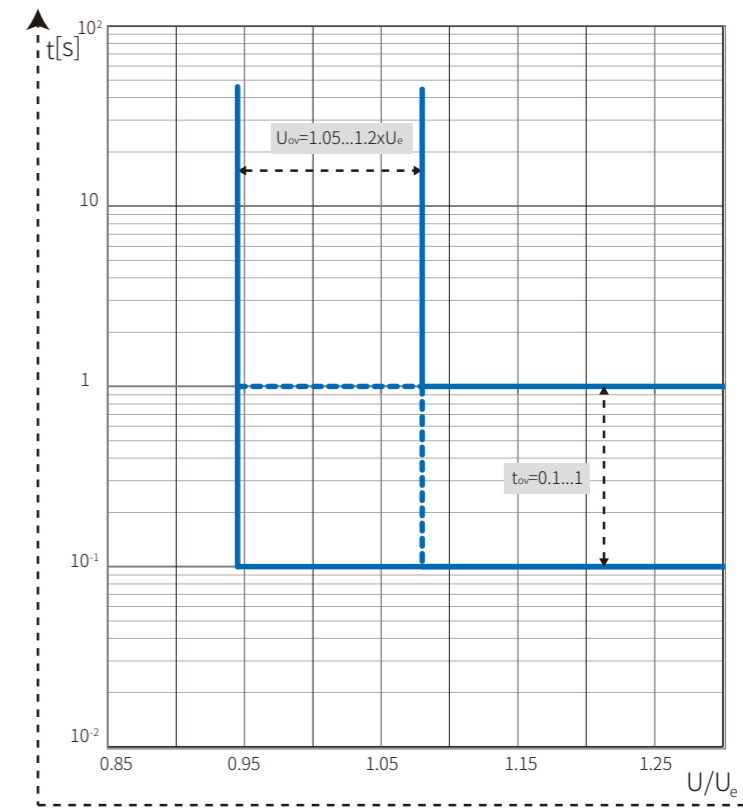
OV 保护
OV Protection



UV 保护
UV Protection



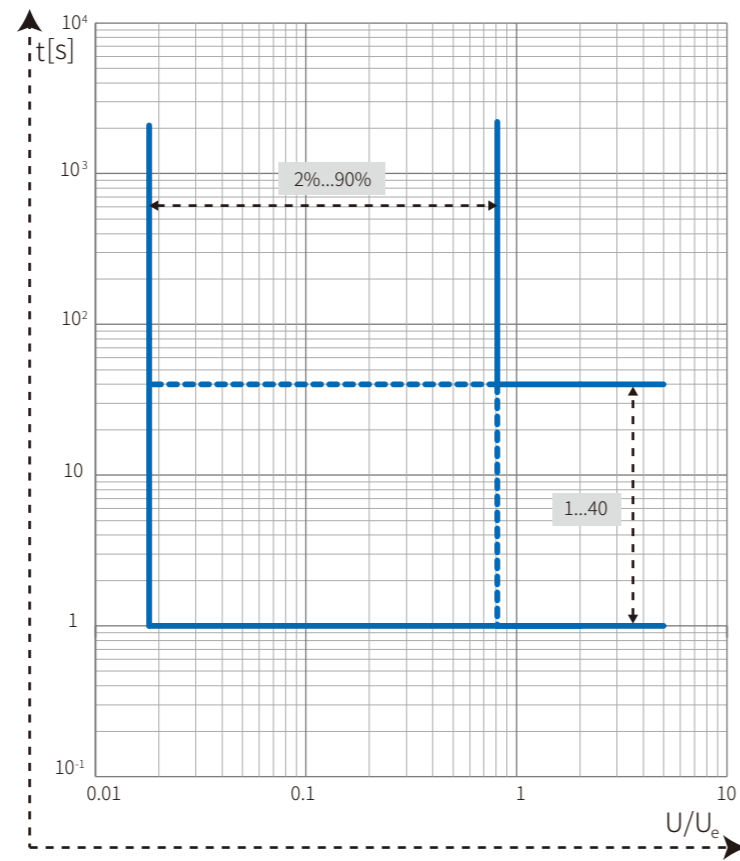
- UV: 欠压保护
UV: Undervoltage protection



Itrip A6

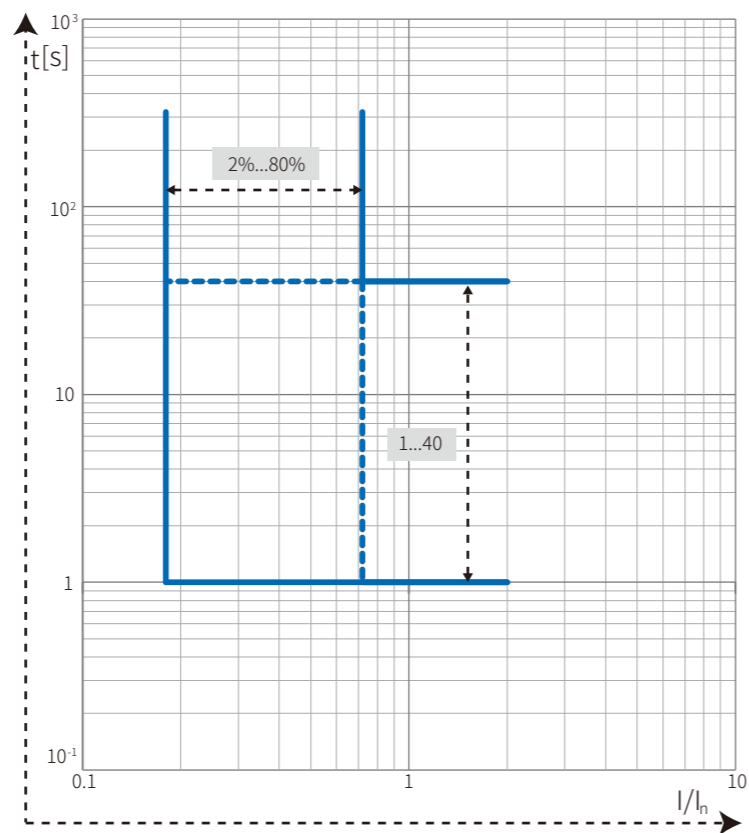
特性曲线 Characteristic curve

电压不平衡保护
Voltage imbalance protection



相不平衡保护
Phase unbalance protection

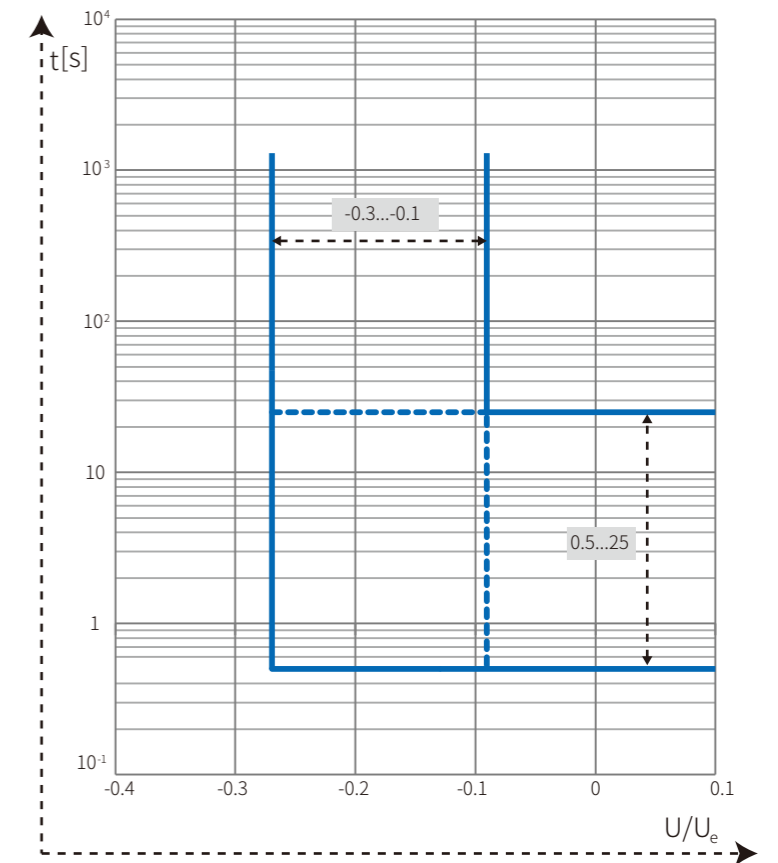
电流不平衡保护
Current unbalance protection



电流不平衡保护
Current unbalance protection

Itrip A6

逆功率保护
Reverse power protection



逆功率保护
Reverse power protection

KFW5

订货信息 ORDERING INFORMATION

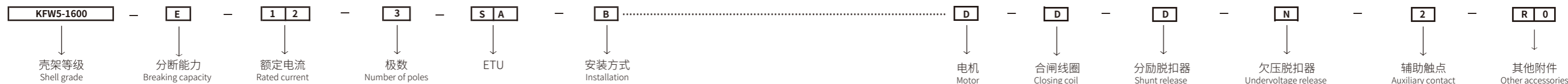
快速选型表 F-1
Quick selection table

附件 F-3
Accessories

订货单 F-5
Order sheet

快速选型表 Quick selection table

订货信息 Ordering information



前11位释义 Top 11 definitions

壳架等级 Shell grade		
1: KFW5-1600		
2: KFW5-2500		
3: KFW5-4000		
4: KFW5-7500		
分断能力 Breaking capacity		
50kA at 415V; 42kA at 690V	E	
55kA at 415V; 50kA at 690V	N	
65kA at 415V; 50kA at 690V	S	
85kA at 415V; 65kA at 690V	H	
100kA at 415V; 65kA at 690V	H1	
100kA at 415V; 85kA at 690V	X	
126kA at 415V; 85kA at 690V	X1	
150kA at 415V; 120kA at 690V	V	
额定电流 Rated current		
200A	02	
400A	04	
630A	06	
800A	08	
1000A	10	
1250A	12	
1600A	16	
2000A	20	
2500A	25	
2900A	29	
3200A	32	
3600A	36	
4000A	40	
5000A	50	
6300A	63	
7500A	75	
极数 Number of poles		
3 极 3-pole	3	
4 极 4-pole	4	
ETU		
ltripA3	BN	
ltripA4	SA	
ltripA6	SB	
ltripA8	SC	
安装方式 Installation		
抽屉式前连接	Withdrawable front connection	A
抽屉式水平后连接	Withdrawable horizontal rear connection	B
抽屉式垂直后连接	Withdrawable vertical rear connection	C
抽屉式混合后连接 (上水平, 下垂直)	Withdrawable mixed rear connection (top horizontal, bottom vertical)	D
抽屉式混合后连接 (上垂直, 下水平)	Withdrawable mixed rear connection (top vertical, bottom horizontal)	E
固定式前连接	Fixed front connection	F
固定式水平后连接	Fixed horizontal rear connection	G
固定式垂直后连接	Fixed vertical rear connection	H
固定式混合后连接 (上水平, 下垂直)	Fixed mixed rear connection (top horizontal, down vertical)	I
固定式混合后连接 (上垂直, 下水平)	Fixed mixed rear connection (top vertical, bottom horizontal)	J

后5位释义 The last five definitions

	电机 Motor	合闸线圈 Closing coil	分励脱扣器 Shunt release	欠压脱扣器 Undervoltage release	辅助触点 Auxiliary contact	
无	N	N	N	N		
DC 110-130V	A	A	A	A		
DC 200-250V	B	B	B	B		
AC 110-130V	C	C	C	C		
AC 200-250V	D	D	D	D		
AC 380-440V	E	E	E	E		
					辅助触点 Auxiliary contact	
					2NO+2NC	1
					4NO+4NC	2
					6NO+6NC	3
					8NO+8NC	4
					10NO+10NC	5

注: KFW5-1600辅助触点最多为4NO+4NC
Note: Auxiliary contacts of KFW5-1600 up to 4NO+4NC

其他附件的补充释义 Supplementary interpretation of other accessories

操作计数器	Operation counter	C	0
合闸准备就绪指示触点	Closing ready indicating contact	R	C
合闸弹簧储能指示触点	Closing spring energy storage indicating contact	S	C
故障脱扣指示触点	Fault trip signal indicating contact	F	T
OFF位置钥匙锁	OFF position key lock	K	L
分/合闸按钮锁按钮锁	On/Off button lock	P	L
“连接/测试/断开”位置指示触点	“On/Test/Off” position indicating contact		
连接位置指示器	On position indicator	P	0
测试位置指示器	Test position indicator	P	1
断开位置指示器	Off position indicator	P	2
1连接+1测试+1断开位置指示器	1 on+ 1 test+1 off position indicator	P	3
二次端子罩	Secondary terminal cover	T	C

附件
Accessories

订货信息
Ordering information

K **F** **W** **5** - **0** **0** **S** **A**

↓ ↓ ↓ ↓

	壳架等级 Shell frame grade	极数 Number of poles	附件 Accessories	
与壳架无关 Unrelated to the frame	0			
1600A	1			
2500A	2			
4000A	3			
7500A	4			
极数 Number of poles				
与极数无关 Unrelated to the number of poles		0		
三级 Three-pole		3		
四级 Four-pole		4		
内部附件 Internal accessories				
辅助触点 Auxiliary contact				
2NO+2NC			A	1
4NO+4NC			A	2
6NO+6NC			A	3
8NO+8NC			A	4
10NO+10NC			A	5
分励脱扣器 Shunt release				
DC:110-130V			S	A
DC:200-250V			S	B
AC:110-130V			S	C
AC:200-250V			S	D
AC:380-440V			S	E
合闸线圈 Closing coil				
DC:110-130V			C	A
DC:200-250V			C	B
AC:110-130V			C	C
AC:200-250V			C	D
AC:380-440V			C	E
电机 Motor				
DC:110-130V			M	A
DC:200-250V			M	B
AC:110-130V			M	C
AC:200-250V			M	D
AC:380-440V			M	E
欠压脱扣器 Undervoltage release				
DC:110-130V			U	A
DC:200-250V			U	B
AC:110-130V			U	C
AC:200-250V			U	D
AC:380-440V			U	E
操作计数器 Operation counter			C	0
OFF 位置钥匙锁 OFF position key lock			K	L
分/合闸按钮锁 Opening/closing button lock			P	L

K **F** **W** **5** **0** **0** **S** **A**

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	壳架等级 Shell frame grade	极数 Number of poles	附件 Accessories	
机械联锁 Mechanical interlock				
固定式 Fixed			F	M
抽屉式 Drawer type			W	M
相间隔板 Phase separator			P	S
二次端子罩 Secondary terminal cover			T	C
门门框 Door frame				
固定式 Fixed type			F	D
抽屉式 Drawer type			W	D

ETU 附件 ETU Accessories

接地互感器 Ground transformer			E	G
外接N相电流互感器 External N-phase current transformer			E	N

订货单
Order sheet

订货信息
Ordering information

订货单位名称		电话		订货数量	
订货单位地址		传真		订货日期	
联系人					
型号	<input type="checkbox"/> KFW5 -				
分断能力级别	<input type="checkbox"/> E 经济型 <input type="checkbox"/> N 普通型 <input type="checkbox"/> S 标准型 <input type="checkbox"/> H 高分断型 <input type="checkbox"/> H1 较高分断型 <input type="checkbox"/> X 极高分断型 <input type="checkbox"/> V 超高分断型				
壳架等级电流	<input type="checkbox"/> 1600 <input type="checkbox"/> 2500 <input type="checkbox"/> 4000 <input type="checkbox"/> 7500				
极数	固定式:	<input type="checkbox"/> 三极 <input type="checkbox"/> 四极			
	抽屉式:	<input type="checkbox"/> 三极 <input type="checkbox"/> 四极			
额定电压	<input type="checkbox"/> AC400V <input type="checkbox"/> AC690V				
智能脱扣器	型号选择	额定电流: $I_n =$ A			
		脱扣器类型: <input type="checkbox"/> Itrip A3: <input type="checkbox"/> Itrip A4 <input type="checkbox"/> Itrip A6			
	基本功能	长延时: 整定电流 I_{r1} <input type="checkbox"/> X I_n 整定时间 t_1 <input type="checkbox"/> s			
		短延时: 整定电流 I_{r2} <input type="checkbox"/> X I_n 整定时间 t_2 <input type="checkbox"/> s			
		瞬时: 整定电流 I_{r3} <input type="checkbox"/> X I_n			
		故障记忆功能 试验功能 自诊断功能 热记忆功能 MCR功能及HSISC功能			
		MCU工作指示 电流表 最大相电流光柱指示 状态指示及数据显示			
	可选功能	接地故障保护: 整定电流 I_{r4} <input type="checkbox"/> X I_n 整定时间 t_4 <input type="checkbox"/> s <input type="checkbox"/> 3P <input type="checkbox"/> 4P <input type="checkbox"/> 3P+N			
		<input type="checkbox"/> 功率测量 <input type="checkbox"/> 谐波测量 <input type="checkbox"/> 故障时钟 <input type="checkbox"/> 过压保护 <input type="checkbox"/> 欠压保护			
		<input type="checkbox"/> 中性相保护 <input type="checkbox"/> 过频保护 <input type="checkbox"/> 欠频保护 <input type="checkbox"/> 电流不平衡保护 <input type="checkbox"/> 逆功率保护			
<input type="checkbox"/> 相序检测 <input type="checkbox"/> 触头磨损及寿命指示 <input type="checkbox"/> 漏电保护 <input type="checkbox"/> 电能测量 <input type="checkbox"/> 信号触点输出					
<input type="checkbox"/> 负载监控保护 <input type="checkbox"/> 电压不平衡保护 <input type="checkbox"/> 电压测量 <input type="checkbox"/> 区域连锁 (<input type="checkbox"/> 方式一 <input type="checkbox"/> 方式二)					
电源	<input type="checkbox"/> AC230V <input type="checkbox"/> AC400V <input type="checkbox"/> DC220V <input type="checkbox"/> DC110V				
标配附件	分励脱扣器	<input type="checkbox"/> AC230V <input type="checkbox"/> AC400V <input type="checkbox"/> DC220V <input type="checkbox"/> DC110V			
	合闸电磁铁	<input type="checkbox"/> AC230V <input type="checkbox"/> AC400V <input type="checkbox"/> DC220V <input type="checkbox"/> DC110V			
	电动操作机构	<input type="checkbox"/> AC230V <input type="checkbox"/> AC400V <input type="checkbox"/> DC220V <input type="checkbox"/> DC110V			
	辅助触头	标配型式: <input type="checkbox"/> 四常开四常闭 <input type="checkbox"/> 六常开六常闭 特殊型式: <input type="checkbox"/> NO <input type="checkbox"/> NC (NO、NC必须相同, 最多10NO, 10NC)			
选择附件	机械连锁	<input type="checkbox"/> 三台断路器 <input type="checkbox"/> -联杆连锁方式一 <input type="checkbox"/> -联杆连锁方式二 <input type="checkbox"/> -联杆连锁方式三 <input type="checkbox"/> -钢缆连锁 <input type="checkbox"/> 两台断路器 <input type="checkbox"/> -联杆连锁 <input type="checkbox"/> -钢缆连锁 <input type="checkbox"/> -多台断路器			
	欠电压脱扣器	<input type="checkbox"/> AC230V <input type="checkbox"/> AC400V <input type="checkbox"/> -欠电压瞬时脱扣器 <input type="checkbox"/> -欠电压延时脱扣器 (<input type="checkbox"/> 0.3s <input type="checkbox"/> 0.5s <input type="checkbox"/> 1s <input type="checkbox"/> 3s <input type="checkbox"/> 5s)			
	分闸锁定装置	一台断路器 <input type="checkbox"/> 一锁一钥匙 两台断路器 <input type="checkbox"/> 两锁一钥匙 三台断路器 <input type="checkbox"/> 三锁二钥匙			
	位置开关	<input type="checkbox"/> 连接位置开关 <input type="checkbox"/> <input type="checkbox"/> 试验位置开关 <input type="checkbox"/> <input type="checkbox"/> 分离位置开关 <input type="checkbox"/> <input type="checkbox"/>			
	其他	<input type="checkbox"/> 相间隔板 <input type="checkbox"/> -门框 <input type="checkbox"/> 计数器 <input type="checkbox"/> 门连锁 <input type="checkbox"/> 互感器(N) <input type="checkbox"/> 电源模块 <input type="checkbox"/> 合闸准备就绪触点 <input type="checkbox"/> ST继电器模块 <input type="checkbox"/> ST电源模块 <input type="checkbox"/> 适配保护			
接线方式	上接线端子:	<input checked="" type="checkbox"/> 水平接线 <input type="checkbox"/> 垂直连接 <input type="checkbox"/> 特殊要求			
	下接线端子:	<input checked="" type="checkbox"/> 水平接线 <input type="checkbox"/> 垂直连接 <input type="checkbox"/> 特殊要求			
备注					

注: 1. 请在□内打√, 规格及附件要求不完全一致时, 请分别填单。
2. 若需两台或两台以上断路器并装, 请在订货时注明。
3. ■表示标准配置。

Customer		Tel		Order quantity	
Customer address		Fax		Order date	
Contact					
Model	<input type="checkbox"/> KFW5 -				
Breaking capacity level	<input type="checkbox"/> E-economical <input type="checkbox"/> N-normal <input type="checkbox"/> S-standard <input type="checkbox"/> H-high breaking type <input type="checkbox"/> H1-Higher breaking type <input type="checkbox"/> X-Extremely high breaking type <input type="checkbox"/> V-Ultra-high breaking type				
Frame size current	<input type="checkbox"/> 1600 <input type="checkbox"/> 2500 <input type="checkbox"/> 4000 <input type="checkbox"/> 7500				
Number of poles	Fixed type:	<input type="checkbox"/> Three-pole <input type="checkbox"/> Four-pole			
	Drawer type:	<input type="checkbox"/> Three-pole <input type="checkbox"/> Four-pole			
Rated voltage	<input type="checkbox"/> AC400V <input type="checkbox"/> AC690V				
Intelligent release	Model selection	Rated current: $I_n =$ A			
		Release type: <input type="checkbox"/> Itrip A3: <input type="checkbox"/> Itrip A4 <input type="checkbox"/> Itrip A6			
	Basic functions	Long delay: Setting current I_{r1} <input type="checkbox"/> X I_n Setting time t_1 <input type="checkbox"/> s			
		Short delay: Setting current I_{r2} <input type="checkbox"/> X I_n Setting time t_2 <input type="checkbox"/> s			
		Transient: Setting current I_{r3} <input type="checkbox"/> X I_n			
		Fault memory function Test function Self-diagnosis function Thermal memory function MCR function and HSISC function			
		MCU working indication Ammeter Maximum phase current light column indication Status indication and data display			
	Optional Features	Ground fault protection: Setting current I_{r4} <input type="checkbox"/> X I_n Setting time t_4 <input type="checkbox"/> s <input type="checkbox"/> 3P <input type="checkbox"/> 4P <input type="checkbox"/> 3P+N			
		<input type="checkbox"/> Power measurement <input type="checkbox"/> Harmonic measurement <input type="checkbox"/> Fault clock <input type="checkbox"/> Overvoltage protection <input type="checkbox"/> Undervoltage protection			
		<input type="checkbox"/> Neutral phase protection <input type="checkbox"/> Over frequency protection <input type="checkbox"/> Under frequency protection <input type="checkbox"/> Current imbalance protection <input type="checkbox"/> Reverse power protection			
<input type="checkbox"/> Phase sequence detection <input type="checkbox"/> Contact wear and life indication <input type="checkbox"/> Leakage protection <input type="checkbox"/> Electric energy measurement <input type="checkbox"/> Signal contact output					
<input type="checkbox"/> Load monitoring protection <input type="checkbox"/> Voltage imbalance protection <input type="checkbox"/> Voltage measurement <input type="checkbox"/> Regional interlocking (<input type="checkbox"/> Method 1 <input type="checkbox"/> Method 2)					
Power Supply	<input type="checkbox"/> AC230V <input type="checkbox"/> AC400V <input type="checkbox"/> DC220V <input type="checkbox"/> DC110V				
Standard accessories	Shunt release	<input type="checkbox"/> AC230V <input type="checkbox"/> AC400V <input type="checkbox"/> DC220V <input type="checkbox"/> DC110V			
	Closing coil	<input type="checkbox"/> AC230V <input type="checkbox"/> AC400V <input type="checkbox"/> DC220V <input type="checkbox"/> DC110V			
	Electric operating mechanism	<input type="checkbox"/> AC230V <input type="checkbox"/> AC400V <input type="checkbox"/> DC220V <input type="checkbox"/> DC110V			
	Auxiliary contact	Standard type: <input type="checkbox"/> 4NO4NC <input type="checkbox"/> 6NO6NC Special type: <input type="checkbox"/> NO <input type="checkbox"/> NC (The same number of NO and NC, with a maximum of 10NO and 10NC)			
Select accessories	Mechanical interlocking	Three circuit breakers <input type="checkbox"/> Link rod interlocking method 1 <input type="checkbox"/> Link rod interlocking method 2 <input type="checkbox"/> Link rod interlocking method 3 <input type="checkbox"/> Steel cable interlocking Two circuit breakers <input type="checkbox"/> Link rod interlocking <input type="checkbox"/> Steel cable interlocking <input type="checkbox"/> Multiple circuit breakers			
	Under voltage release	<input type="checkbox"/> AC230V <input type="checkbox"/> AC400V <input type="checkbox"/> Undervoltage instantaneous release <input type="checkbox"/> Undervoltage delay release (<input type="checkbox"/> 0.3s <input type="checkbox"/> 0.5s <input type="checkbox"/> 1s <input type="checkbox"/> 3s <input type="checkbox"/> 5s)			
	Opening locking device	One circuit breaker <input type="checkbox"/> One-lock one-key Two circuit breakers <input type="checkbox"/> Two-lock one-key Three circuit breakers <input type="checkbox"/> Three-lock two-key			
	Position switch	<input type="checkbox"/> On position switch <input type="checkbox"/> <input type="checkbox"/> Test position switch <input type="checkbox"/> <input type="checkbox"/> Off position switch <input type="checkbox"/> <input type="checkbox"/>			
	Other	<input type="checkbox"/> Phase partition <input type="checkbox"/> Door frame <input type="checkbox"/> Counter <input type="checkbox"/> Door interlock <input type="checkbox"/> Transformer (N) <input type="checkbox"/> Power module <input type="checkbox"/> Closing ready contact <input type="checkbox"/> ST Relay module <input type="checkbox"/> ST Power module <input type="checkbox"/> Adaptive protection			
Connection modes	Top wiring terminal:	<input checked="" type="checkbox"/> Horizontal wiring <input type="checkbox"/> Vertical connection <input type="checkbox"/> Special requirements			
	Bottom wiring terminal:	<input checked="" type="checkbox"/> Horizontal wiring <input type="checkbox"/> Vertical connection <input type="checkbox"/> Special requirements			
Remarks					

Note: 1. Please mark √ in □. If the accessories are not the same in the specifications and the requirements, please fill out the sheet separately.
2. If two or more circuit breakers need to be installed together, please specify it when ordering.
3. ■ indicates standard configuration.