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川开电气有限公司
Chuan Kai Electric Co., Ltd.



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KYN28A-12

铠装移开式交流金属封闭开关设备资料

Type KYN28A-12 AC Metal-clad Withdrawable Switchgear

技术资料

Technical Data



川开电气有限公司
Chuan Kai Electric Co., Ltd.



企业概况

Company Profile

川开电气有限公司(Chuan Kai Electric Co.,Ltd.,简称“川开电气”),位于天府之国成都。系青岛特锐德电气股份有限公司(创业板第一股,股票代码:300001)全资子公司,占地301亩,注册资本金3.0468亿元。

川开电气专业从事输配电成套设备研发、设计、制造、销售、安装、技术咨询、融资租赁等一体化服务,是原机械部、电力部定点生产许可企业。整体规模和实力名列西南地区第1名,全国电气开关行业前10名。先后荣获国家级高新技术企业、四川省先进企业、四川省重合同守信用企业、四川省名牌产品企业等荣誉称号。

川开电气主要产品及服务包括:252kV及以下高、中、低压开关柜、110kV预装式中心变电站、电气元件、12-40.5kV预装式变电站(开关站)、交/直流一体化系统、EPS应急电源、配电箱、动力箱、电缆桥架、封闭母线槽、共箱母线、预分支电缆及融资租赁、电力工程总承包施工、电力设备维保等。2006年全国首家通过核级中低压成套设备国家级鉴定。产品适用于电厂、电网、核电、军工、航空航天、轨道交通、通信、石油石化、冶金、市政、机械、电子、轻工、建材等各领域,畅销全国,远销东南亚、中亚及非洲国家,以其高品质性价比及优良、快捷、完善的服务,赢得了社会各界和广大客户的一致认同和好评。

川开电气以人为本,重视人力资源开发和综合素质培养,聚集了一大批高素质的管理和技术人才。建立了院士专家工作站、国家输配电重点实验室实训基地及四川省级企业技术中心。始终奉行与巨人同行的原则,与西门子、ABB、阿尔斯通、GE、施耐德等世界著名电气公司开展了全方位的技术引进和OEM合作,不断提升产品可靠性、安全性;率先引进美国、日本、德国、瑞士等国家先进加工设备;产品的设计、制造全部过程采用CAD、CAPP、CAM、INVENTOR,建立了产品数据管理系统(PDM);通过ISO9001质量管理体系、ISO14001环境管理体系认证、OHSAS18001职业健康安全管理体系认证、核工业质量管理体系认证证书,并完善了计量管理体系。所有产品均按国际、国家和行业标准通过了型式试验和相应认证。

川开电气的发展,得到了社会各界的信赖和支持。川开电气将秉承“感动客户、以人为本、和谐高效、回报社会”的核心价值观,以成为国内电力设备制造业的领军者,带动中国电力设备制造业步入国际梯队为目标,把川开电气打造成行业内最受尊重的伟大公司。

川开电气致力于为您提供更优的整体输配电解决方案,点亮和谐美好生活!

Chuan Kai Electric Co., Ltd. (Chuan Kai Electric) is located in Chengdu, the land of abundance. It was established in 1980 and originally attached to Chuan Kai Industry Group Co., Ltd. Chuan Kai Electric achieve the reorganization of assets and with Qingdao TGOOD Electric Co., Ltd.(the first gem shares, stock code: 300001) in November 2015 and became its wholly owned subsidiary with registered capital of RMB 304.68million.

Chuan Kai Electric specializes in R&D, design, manufacturing, sales, installation, technical consulting, financial lease and other integrated services on power transmission and distribution equipment, which makes it become a enterprise with production license designated by the former Machinery Department and Power Department. Its overall scale and strength rank first in the southwest and top 10 in the national electrical switch industry. It wins many honorary titles such as the national high-tech enterprise, advanced enterprise in Sichuan Province, Enterprise in Good Credit in Sichuan Province, Famous Brand Product Enterprise in Sichuan Province.

The main products and services of Chuan Kai electric include: 252kV and below high, medium and low voltage switchgear, 110kV preinstalled central substation, electrical components, 12-40.5kV preinstalled substation (switch station), AC / DC integrated system, EPS emergency power supply, power distribution box, power box, cable bridge, closed bus slot, common bus bus, preview. Supporting cable and finance leasing, power engineering general contracting construction, power equipment maintenance and so on. In 2006, the first national evaluation of nuclear power equipment in China was carried out. The products are suitable for power plants, power grids, nuclear power, military industry, aerospace, rail transportation, communications, petroleum and petrochemical, metallurgical, municipal, mechanical, electronic, light industry, building materials and other fields. It is sold to the whole country and exported to Southeast Asia, Central Asia and African countries, with its high quality, good, fast and perfect service. The consensus and recognition from all walks of life and customers.

Chuan Kai Electric keeps people-oriented, pays attention to the development of human resources and comprehensive quality training, gathering a large number of high-quality management and technical personnel and sets academician expert workstation, the training base of national transmission and distribution key laboratory and Sichuan provincial enterprise technology center. It always adheres to following the step of the excellent counterparts, so it carries out a full range of technology introduction and OEM cooperation with Siemens, ABB, ALSTOM, GE, Schneider and other world famous electric company for continuously product improvement in reliability and safety. In addition, Chuan Kai Electric takes the lead in the introduction of advanced processing equipment from the United States, Japan, Germany, and Switzerland and so on. The design and manufacturing process of product adopts CAD/CAPP/CAM/INVENTOR, which establishes the product data management system (PDM); it has passed the ISO9001 quality management system, ISO 14001 environmental management system, OHSAS18001 occupational health, Certification of the quality management system of the nuclear industry and safety management system, and improved the measurement management system. All products of Chuan Kai Electric pass the type test and the corresponding certification in accordance with international, national and industry standards.

The development of Chuan Kai Electric has gained the trust and support of social circles. Chuan Kai Electric will be adhering to the core values of the customer touched, people-oriented, harmony and efficiency, and society reward to become the leader of domestic power equipment manufacturing industry, and aim at bringing along Chinese power equipment manufacture into the international echelon, and building the Chuan Kai Electric into a company with high respect in same industry.

Chuan Kai Electric is dedicated to provide you with the best whole power transmission and distribution solutions for harmonious and better life!

KYN28A-12 铠装移开式交流金属封闭开关设备

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KYN28A-12铠装移开式交流金属封闭开关设备
KYN28A-12 metal-clad withdrawable AC switchgear

概述
General

适用范围和主要用途

Application scope and main applications

KYN28A-12铠装移开式交流金属封闭开关设备(以下简称开关设备), 适用于户内三相50/60Hz额定电电压12kV的电力系统中, 主要应用于发电厂、变电所、工矿企业及高层建筑中作为接受和分配电能并对电路实行控制、保护和监测。

KYN28A-12型开关设备是技术先进、性能稳定、结构合理、使用方便、安全可靠的配电设备, 此设备具有各种防止误操作的功能, 包括防止带负荷移动手车、防止接地开关闭合位置合断路器、防止带电合接地开关和防止误入带电隔室等功能。KYN28A-12开关设备配置性能优良的CVD4户内高压交流真空断路器或品牌真空断路器。开关设备二次回路配置先进可靠的控制保护元件, 母线采用热伸缩绝缘材料或环氧涂覆的绝缘手段, 优化电极形状, 柜体结构紧凑。

Type KYN28A-12 AC metal-clad withdrawable switchgear (hereinafter called switchgear), is applicable for 3-phase, 50/60Hz indoor power system for rated voltage 12kV, and mainly used to receive and distribute electric energy, and to control, protect and monitor the circuits in power generation plants, substations industrial & mining enterprises and high-rise buildings, etc.

Type KYN28A-12 switchgear is safe and reliable power distribution equipment with advanced technology, good performance, reasonable structure and convenient operation. KYN28A-12 switchgear has anti-maloperation functions, e.g. preventing trolley from moving with load, preventing circuit breaker from closing while earthing switch is at closed position, preventing earthing switch from closing with power on and preventing personnel from accessing live compartment mistakenly, etc. It is equipped with type CVD4 series medium voltage AC vacuum circuit breaker or embedded pole vacuum circuit breaker, which has very excellent performance. And it's equipped with advanced and reliable components for its secondary circuits for control and protection. Thermal contraction materials or epoxy resin is used for insulation of busbars, as optimize its electrode shape and make cabinet structure more compact.

产品引用标准

Standards applied

- a) GB3906 3.6kV-40.5kV交流金属封闭开关设备和控制设备
- b) GB/T11022 高压开关设备和控制设备标准的共用技术要求
- c) DL/T404 户内交流高压开关柜订货技术条件
- d) DL/T593 高压开关设备的共用订货技术导则
- e) IEC62271-200 1kV-52kV交流金属封闭开关设备和控制设备: 200部分
- f) GB1984 高压交流断路器
- a) GB3906 3.6kV-40.5kV AC metal closed switch equipment and control equipment.
- b) GB/T11022 Common technical specifications of high voltage switchgear and controlgear
- c) DL/T404 Technical specifications for order of indoor AC high voltage switchgear
- d) DL/T593 Common technical guide for order of high voltage switchgear
- e) IEC62271-200 Part200: AC metal-enclosed switchgear and controlgear for rated voltages above 1kV and up to and including 52kV
- f) GB1984 High voltage AC circuit breaker

正常使用环境

Normal service conditions

- a) 环境温度: 最高温度: +40℃, 最低温度: -15℃, 且在24h内测得的平均值不超过35℃。
- b) 湿度条件如下:
 - 日相对湿度的平均值不超过95%; 月相对湿度平均值不超过90%;
 - 日水蒸气压力的平均值不超过2.2kPa; 月水蒸气压力平均值不超过1.8kPa。
- c) 海拔高度不大于1000m。
- d) 周围空气没有明显受到尘埃、烟、腐蚀性或可燃气体、蒸汽或烟雾的污染。
- e) 地震烈度不超过8度。
- a) Ambient temperature: +40℃~15℃. Average value measured within 24 hours does not exceed 35℃.
- b) Humidity:
 - The average daily relative humidity does not exceed 95%; average monthly relative humidity does not exceed 90%.
 - The average daily vapor pressure does not exceed 2.2kPa; average monthly vapor pressure does not exceed 1.8kPa.
- c) The altitude does not exceed 1000m.
- d) The ambient air shall not be obviously polluted by dust, smoke, corrosive and flammable gas, vapor and smoke fog.
- e) The earthquake intensity does not exceed 8 magnitude.

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特殊使用条件

Special service conditions

在超过GB/T11022规定的正常环境条件下使用时，本公司和用户可就超出正常运行条件的特殊运行条件进行协商，并达成协议。

为防止凝露现象，开关设备设有加热器，当开关设备处于备用状态时应投入使用 开关设备正常运行时也应注意投运加热器

When the service conditions are above the normal ones stipulated in GB/T11022, the customers may consult with our company.

In order to prevent from condensation, the switchgear is equipped with space heater. When the switchgear is ready to be put into operation, the space heater shall be put into service first, and even when the switchgear is in normal operation, it shall be paid attention to put the space heater into service.

技术参数

Technical data

开关设备主要技术参数

Main technical data of switchgear

项 目 Item		单 位Unit	数 据 Data
额定电压 Rated voltage		kV	3.6、7.2、12
额定绝缘水平 Rated insulation level	1 min工频耐受电压 1 Min. Power frequency withstand voltage	kV	42
	雷电冲击耐受电压（全波） Impulse withstand voltage (full wave)	kV	75
额定频率 Rated frequency		Hz	50
母线额定电流 Rated current of busbar		A	630、1250、1600、2000、2500、3150、4000
额定短时耐受电流 Rated short-duration withstand current		kA/4s	25、31.5、40、50
额定峰值耐受电流 Rated peak withstand current		kA	63、80、100、125
隔板等级 Partition Class			PM级
运行连续性丧失类别 Loss of service continuity category(LSC)			LSC2B级
内部电弧等级 Internal arcing class			31.5KA/0.5s

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开关设备外形尺寸

Switchgear Dimensions

配套断路器 Circuit breaker equipped with		CVD4 ZN18A	3AH5 3AH3
		VD4 VEP 3AE HXV VN3 VS1	
高度H（ mm ） Height H (mm)		2200	2200
宽度 W (mm) Width W (mm)	额定电流至1250A Rated current up to 1250A	800 (650)	800
	额定短时耐受电流至31.5kA Rated short-duration withstand current up to 31.5kA		
	额定电流至2000A Rated current up to 2000A	1000 (800)	1000 (800)
	额定短时耐受电流至50kA Rated short-duration withstand current up to 50kA		
	额定电流达4000A Rated current up to 4000A	1000	1000
	额定短时耐受电流至50kA Rated short-duration withstand current up to 50kA		
深度 D (mm)	标准方案 Depth D (mm) Standard scheme	基本骨架 Basic frame	1770
		含前后门 Including front and back doors	1850
	架空方案 Overhead incoming or outgoing scheme	基本骨架 Basic frame	1970

KYN28A-12 铠装移开式交流金属封闭开关设备

结构特点

Structure Features

KYN28A-12 开关设备由柜体和可移开部件 (俗称手车) 两大部分组成。柜体用金属隔板分成多个功能隔室, 如母线室、断路器室、电缆室和继电器仪表室等。

开关设备的可移开部件可配置真空断路器手车、电压互感器手车、避雷器手车、隔离手车和熔断器手车等。

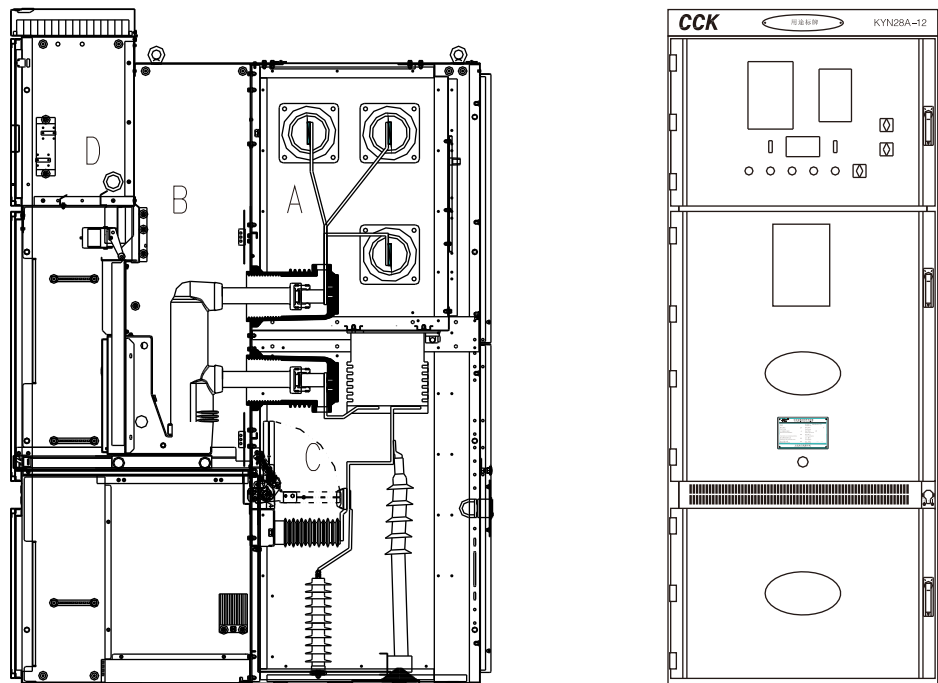
KYN28A-12 智能开关设备具有以下功能:

电动操作: 电动操作手车进车和退车; 电动操作接地开关合闸和分闸。

在线监控: 微机保护功能, 自动启动风机散热, 自动启停加热器除湿, 在线真空度监测报警, 在线监测一次回路温升, 在线监测开关设备运行状态。

KYN28A-12 switchgear, is composed of cabinet and withdrawable part (usu. called trolley). And the whole cabinet is divided into several functional compartments by metal partitions, e.g. busbar compartment, circuit breaker compartment, cable connection compartment and relay & instrument compartment, etc.

Withdrawable part of switchgear can be provided with vacuum circuit breaker, PT trolley, lightning arrester trolley, disconnecting trolley and fuse trolley, etc.



A. 母线室 B. 断路器手车室 C. 电缆室 D. 继电器仪表室

A. Busbar compartment B. Circuit breaker trolley compartment
C. Cable connection compartment D. Relay & instrument compartment

图一KYN28A-12开关设备结构示意图
Fig. 1 Structure of Type KYN28A-12 Switchgear

KYN28A-12 铠装移开式交流金属封闭开关设备



图二 开关设备断路器手车室布置图
Fig. 2 Switch equipment circuit breaker hand room layout.

外壳

Enclosure

开关设备的外壳选用进口敷铝锌钢板, 经CNC机床加工, 采取折边工艺制作而成。整个柜体具有精度高和很强的抗腐蚀与抗氧化性能, 而且由于采用折边工艺, 使柜体比其它同类设备柜体整体重量轻、机械强度高, 外形美观。柜体采用组装式结构, 结构铆钉铆接用拉铆螺母和高强度的螺栓连接而成, 使加工生产周期缩短, 零部件通用性强, 占地面积小, 便于组织生产。

Enclosure of switchgear is made of imported Al-Zn plated sheet steel by means of bending by CNC machine tool. And the whole cabinet is with a performance of high precision, strong anti-corrosion and anti-oxidation, and is lighter in weight than any other same kind of switchgear cabinet, higher in mechanical strength, and beautiful in appearance. The cabinet is of assembling structure and is riveted by bolts and nuts of high strength, as shorten the production period, and it's convenient for organization of production because of its wide generalization of parts and components, and space-saving features.

手车

Trolley

手车骨架采用钢板经激光切割加工后焊装而成。手车与柜体配合精度高, 机械联锁安全、可靠、灵活。手车根据用途不同分为断路器手车、电压互感器手车、计量手车、隔离手车等, 同类型、同规格手车可以自由互换。手车在柜体内有断开/试验和工作位置, 每一位置都分别有定位装置, 以保证联锁可靠。各种手车均采用丝杆推进、退出, 操作轻便、灵活, 适合值班人员操作。当手车需要移开柜体时, 用一台专用转运车就可方便取出, 以便进行各种检查和维护。

当手车用转运车运入柜体断路器室时, 便能可靠锁定在断开/试验位置, 并且柜体位置指示灯显示其所在位置。只有手车完全锁定后, 才能摇动丝杆推进机构, 将手车推向工作位置。手车到达工作位置时, 推进手柄操作力突然加大并摇转不动, 其对应位置指示灯便显示其所在位置。手车的机械联锁能可靠保证手车只有在工作位置或试验位置, 断路器才能进行合闸; 而且断路器只有在分闸状态, 手车才能移动。

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The trolley framework is made from steel plate by means of welding after being laser cut. And there's a high precision for coordination between trolley and cabinet with a safe reliable, and flexible mechanical interlocking. Trolley is classified into circuit breaker trolley (CB trolley), PT trolley, metering trolley, disconnecting trolley according to the different purposes, and the trolleys of same specification can be interchanged freely. Inside the cabinet there're disconnected/test position and service position for trolley and each position is set with positioning device to ensure reliable interlocking. And all kinds of trolleys are driven in/out with screw driving mechanism, which can be operated handily and flexibly and is applicable for operation by operator on duty. When a trolley is necessary to be pulled out of cabinet, it can be achieved by a service trolley easily, so as to perform an inspection and maintenance on the trolley.

When a trolley is got back into the CB compartment of cabinet with a service trolley, it can be locked effectively in disconnected/test position, and the position indicator light shall indicate the corresponding position. Only when the trolley is completely locked, can the screw driving mechanism be rocked to drive the trolley into the service position. When the trolley reaches the service position, the operation force of operation handle increases abruptly and the handle can not be rocked at this moment, then the corresponding indicator light shall indicate trolley's position. Mechanical interlocking of trolley ensure that only when the trolley is in service position or test position, can the circuit breaker be closed; only when the circuit breaker is opened, can the trolley be driven.

隔室 Compartment

开关设备主要电气元件都有其独立的隔室，即：断路器手车室、母线室、电缆室、继电器仪表室等。各隔室防护等级都达到IP2X。除继电器仪表室外，其它三个隔室都分别有泄压通道。由于采用了中置式形式，电缆室空间大为增加，因此设备可并接多路电缆。

a) 母线隔室A：主母线是单台拼接互相贯穿联接，通过分支母线（静触头盒）及主母线绝缘套管固定。主母线和联络母线为矩形截面的铜排，用于大电流负荷时采用双母排。对于特殊需要，母线可用热缩套管和定制的绝缘罩盒覆盖。相邻柜母线间安装有绝缘套管，如果出现内部故障电弧时，套管能有效把事故限制在隔室内而不向其它柜蔓延。

b) 断路器隔室B：隔室两侧安装了轨道，供手车在柜内由断开/试验位置移动至工作位置。静触头盒的隔板(活门)安装在手车室的后壁处，当手车从断开/试验位置移动到工作位置过程中，静触头盒口处的上、下活门与手车联动自动打开；当反向移动时，活门则自动闭合，直至手车退至一定位置而完全覆盖住静触头盒，形成有效隔离。由于上、下活门之间不联动，在检修时，可锁定带电侧的活门，从而保证检修维护人员不触及带电体。在断路器室门关闭时，手车同样能被操作。通过门上的观察窗，可以观察隔室内手车所处位置，合、分闸指示及储能状况。

c) 电缆隔室C：开关设备采用中置式，因而电缆室空间较大。电流互感器吊装于隔室上部、接地开关装于设备中部（接地开关也可根据客户要求装在隔室后壁上），避雷器安装于隔室后下部。将手车和可抽出式水平隔板移开后，施工人员能从正面进入柜内安装和维护。电缆室内的电缆连接导体，每相可并接1-3根电缆，必要时每相可并接6根电缆，电缆隔室的柜底配制可卸式开缝的金属封板或不导磁金属封板，确保了施工方便。

d) 继电器仪表室D：继电器仪表室内可安装继电器保护元件、仪表、带电显示指示器以及特殊要求的二次设备。控制线路敷设在线槽内，线槽有金属盖板，可使二次线与高压元件隔离。左前侧线槽是为控制电缆的引进和引出预留的，底板相应部位开有二次电缆穿线孔。在继电器仪表室的顶板上还留有便于施工的小母线穿越孔，接线时仪表室顶盖板可翻开，便于小母线的安装。

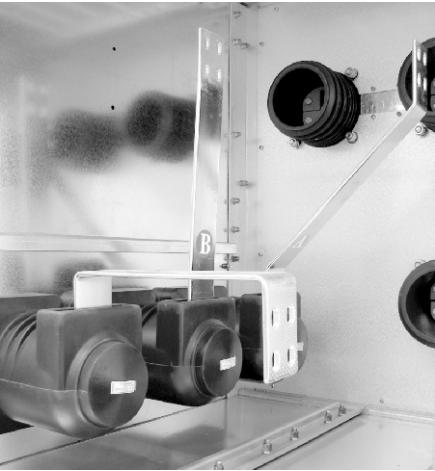
KYN28A-12 铠装移开式交流金属封闭开关设备

Main electric components of switchgear have their independent compartments, that is, CB trolley compartment, busbar compartment, cable connection compartment, relay & instrument compartment, and these compartments have protection degree of IP2X. Except relay & instrument compartment, the other three compartments are provided with pressure relief channels. The cable connection compartment's space is largely increased because the function truck is central-located, so the switchgear can be connected with multiple cables in parallel.

a) Busbar compartment A: main busbars are connected within one cabinet and connected through each other, and fixed by insulating bushings of branch busbars (fixed contact box) and main busbars. Main busbars and connection busbars are copper bars in rectangular cross section. Double pieces of busbars are adopted for heavy current load. And for special use, busbars can be covered with thermal contraction bushings or customized insulating covers. The busbars of adjacent cabinets are provided with insulating bushings, which can make the accident caused by arc due to internal fault controlled within the compartment.

b) CB compartment B: guide rails are mounted at the two sides of compartment for trolley moving from disconnected/test position to service position in the cabinet. Partition (shutter) of fixed contact box is mounted at the back wall of trolley compartment, and when the trolley is moved from disconnected/test position to service position, the upper and lower shutters of fixed contact box work with trolley and open automatically, and when the trolley is moved backward, the shutter shall close automatically and segregate fixed contact box completely with trolley until the trolley is back to certain distance, so as to form an effective segregation. As there's no linkage between upper and lower shutters, it can lock the shutter of live side to protect the maintainer from touching live parts during an inspection and maintenance. The trolley can still be operated when the CB compartment's door is closed. Through the inspection window, the trolley's position in compartment, closing/opening indication and energy storage conditions can be observed.

c) Cable connection compartment C: Because of the central location construction of trolley, the cable connection compartment has a bigger space. CT and earthing switch are mounted at the back wall of this compartment (earthing switch also can be mounted at the middle part of switchgear depending on the requirements of user), while lightning arresters are mounted at the lower part of the back of compartment. Constructors can access from front of cabinet to carry out installation and maintenance after the trolley and withdrawable horizontal partition are pulled out. Cable connecting conductors inside cabinet can be connected with 1-3 cables for each phase, if necessary, 6 cables can be connected with. And the bottom of cable compartment is arranged with detachable metal sealing gland or non-magnet conductive metal sealing plate to ensure convenient construction.



母线室
Busbar compartment



电缆隔室
Cable connection compartment

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d) Relay & instrument compartment D: in this compartment, it can be mounted with relay protection components, instruments, voltage presence indicator and special required secondary devices. Control wires are laid out in the wiring duct, which is equipped with metal cover plate to segregate secondary wires and high voltage components. Front left side of the wiring ducts are reserved for incoming and outgoing of control cables, and the corresponding part of bottom plate is drilled with holes for secondary cables going through. On top plate of compartment are reserved holes for small busbar going through, and the top cover plate of instrument compartment can be opened during connection and it is convenient for small busbar installation.

泄压装置

Pressure relief device

在手车室、母线室和电缆室的上方均设有泄压装置，当隔室内发生故障产生电弧时，开关柜内部气压升高，装设在前门上的特殊密封圈把柜门封闭起来，顶部装备的泄压金属板被自动打开，释放压力和高温气体，确保操作人员 and 开关设备的安全。

Pressure relief device is set on the top of trolley compartment, busbar compartment and cable compartment, and when arc is produced due to fault inside compartment, the gas pressure inside switchgear is increased, special sealing ring set on the front door has the cabinet door closed, and the pressure relief metal plate on the top of cabinet shall open automatically to release pressure and high temperature gas, so as to ensure safety of operator and switchgear.

二次插头与手车的位置联锁

Position interlocking between secondary plug and trolley

开关设备和手车的二次连接线是通过二次插头的联络实现的。二次插头通过一根尼龙波纹伸缩管与手车相连，装设在手车室的右上方。手车只有在试验/断开位置时，才能插上或拔除二次插头。手车进入工作位置时二次插头被锁定。配装合闸闭锁电磁铁的断路器手车，在二次插头接通之前，手车的合闸机构被电磁铁锁定，仅能分闸，无法进行合闸操作。

Secondary connection between switchgear and trolley is done by secondary plug, and secondary plug is connected with trolley by a nylon bellows, and secondary socket is set at the right upper part of trolley compartment. Only when the trolley is in test/disconnected position, can the secondary plug be plugged in or out. Secondary plug is locked when the trolley is entering into service position. The CB trolley with closing locking electromagnet can only perform opening operation, and can not perform closing operation before the secondary plug is plugged in, because its closing mechanism is locked by electromagnet.

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带电显示装置

Voltage presence indicator

开关设备可装检测一次回路运行的带电显示装置，该装置由高压传感器和显示器两部分组成。该装置可以提示高压回路带电状况，还可以与电磁锁配合，对操作手柄、柜门和邻柜实现强制闭锁，达到防止带负荷移动隔离手车、防止带电关合接地开关、防止误入带电间隔的目的，提高配套产品的防误性能。

Switchgear can be mounted with voltage presence indicator for testing primary circuit, which comprises high voltage sensor and display. It can indicate energizing state of high voltage circuit and also can work with electromagnetic lock to achieve compulsive locking to operation handle, cabinet door and adjacent cabinet to prevent trolley from moving with load, prevent personnel from accessing live compartments mistakenly, so as to enhance the anti-maloperation performance.

防止凝露

Anti-condensation

为了防止在高湿度或温度变化较大的环境中产生凝露，在断路器室和电缆室分别装设电加热器，以便在上述运行条件下防止绝缘事故的发生。

To prevent production of condensation in an environment with high humidity or intensive temperature change, heaters are respectively mounted in CB compartment and cable connection compartment to avoid insulation accident when the switchgear is working under above conditions.

接地装置

Earthing device

在电缆室内单独设有5X50mm²的接地铜排，且贯穿相邻各柜体并与柜体良好连接，供直接接地之元器件使用。由于整个柜体用敷铝锌板相拼接，这样使整个柜体都处在良好的接地状态之中，确保运行操作人员触及柜体时的安全。

The copper earthing busbars of 5X50mm² are provided in the cable connection compartment, which goes through adjacent cabinets and are connected effectively with cabinets for directly earthed components. Because the whole cabinet is jointed with Al-Zn plated sheet steel, the whole cabinet is earthed effectively, which ensure the operator safe when touching the cabinet.

KYN28A-12 铠装移开式交流金属封闭开关设备

防止误操作联锁装置及工作原理

Anti-maloperation interlocking and its operation principle

开关设备内装有安全可靠的联锁装置，完全满足“五防”的要求。

- a) 仪表室门上装有提示性的按钮或者KK型转换开关以防止误合、误分断路器。
- b) 断路器手车只有在试验或工作位置时，断路器才能进行合、分操作，而且在合闸后，手车被锁住无法移动，防止带负荷时推、拉手车；
- c) 仅当接地开关处在分闸位置时，断路器手车才能从试验/断开位置移至工作位置；仅当断路器手车处于试验/断开位置时，接地开关才能进行合闸操作（接地开关可带电压显示装置）。这样实现了防止接地开关处在闭合位置时关合断路器以及防止带电误合接地开关；
- d) 接地开关处于分闸位置时，下门及后门被闭锁，防止误入带电间隔；
- e) 按客户要求配装合闸闭锁电磁铁的断路器手车，在未使闭锁装置解锁的情况下，能阻止手动或电动合闸操作；
- f) 断路器手车在工作位置时，二次插头被锁定不能拔除；
- g) 各柜间可装电气联锁。

本开关设备还可在接地开关操作机构上加装电磁铁锁定装置以提高可靠性，并可按用户要求提供后柜门与接地开关操作的反向联锁装置，订货时按用户的需求选择。

Switchgear is provided with safe and reliable interlocking, which meets the requirements of “five anti-error protection measures” .

- a) On the instrument compartment door is prompt pushbutton or KK changeover switch to prevent from mistakenly closing and opening circuit breaker.
- b) Only when the circuit breaker trolley is in test position or service position, can circuit breaker be closed and opened, and the trolley shall be locked and cannot be moved after closing, so as to prevent from driving in and out trolley with load.
- c) Only when the earthing switch is in opened position, can circuit breaker trolley be driven from test/disconnected position to service position, and only when the circuit breaker is in test/disconnected position, can earthing switch close (earthing switch can be provided with voltage presence indicator), which prevent from making circuit breaker when earthing switch is in closed position and mistakenly closing earthing switch with power on.
- d) When the earthing switch is in opened position, the lower door and rear door are locked, so as to prevent operator from entering live compartments by mistake.
- e) The circuit breaker trolley, equipped with closing locking electromagnet according to the requirements of user, can prevent from closing manually or electrically before unlocking the locking device.
- f) When the circuit breaker trolley is in service position, the secondary plug is locked and can't be pulled out.
- g) Electric interlocking can be equipped with among cabinets.

In addition, operating mechanism of earthing switch can be provided with electromagnetic locking device to enhance reliability, and moreover, it can be provided with reversed interlocking to rear cabinet door and operating mechanism of earthing switch according to the requirements of user. And users can select the scheme according to the requirements when placing an order.

KYN28A-12 铠装移开式交流金属封闭开关设备

元器件介绍

Introduction to Components

CVD4-12真空断路器

Type CVD4-12 Vacuum Circuit Breaker

CVD4系列真空断路器是川开电气有限公司最新研发生产的户内高压真空断路器，可广泛用于电厂、电网、工矿企业、石化、市政供电等配电领域；

CVD4系列真空断路器功能、系列齐全，能满足各种用户不同的配电、控制、保护需求；

12kV额定电流630A-4000A， 额定开断电流25kA-50kA；

CVD4系列真空断路器极柱采用超低回路电阻型真空灭弧室，采用双APG固封技术将灭弧室和一次导电回路组件固封于环氧树脂内，形成极柱产品，使得断路器能耗更低、温升更低、绝缘更加可靠；

CVD4系列真空断路器机构采用了模块化设计、提高用户管理、维护、保养效率、缩短换件时间，降低使用成本；

CVD4系列真空断路器采用了高性能专用油缓冲器，优化了结构设计，使断路器拥有稳定、完美的分合闸曲线；

CVD4系列真空断路器严格按照IEC、GB、DL以及核电相关技术规范、标准的要求通过了整套产品型式试验。

Type CVD4 series vacuum circuit breakers are indoor medium voltage vacuum circuit breakers newly developed by CCK, and they are widely applicable for power distribution fields, such as power plants, power grids, industrial and mining enterprises, petrochemical industries, municipal power supplies, etc.

Type CVD4 series vacuum circuit breakers are of complete functions and scheme solutions, which can meet the different power distribution, control and protection requirement of various users.

The poles of type CVD4 series vacuum circuit breakers are of super low loop resistance vacuum interrupters, and double APG pole-embedded technology are adopted to make the interrupter and conductive assemblies of primary circuit embedded into the epoxy resin insulating enclosure. As makes the circuit breaker with lower energy consumed, lower temperature rise and more reliable insulation.

Rated Current: 630A~4000A, Rated Short-Circuit Breaking Current: 25kA~50kA.

Type CVD4 series vacuum circuit breakers are of module design which improves the management and maintenance efficiency, shortens the component replacing time and reduces the cost.

Type CVD4 series vacuum circuit breakers are adopted high performance oil buffers and optimized construction design, as makes the circuit breakers with reliable and complete tripping and closing curves.

Type CVD4 series vacuum circuit breakers are strictly in accordance with IEC, GB, DL standards, concerned nuclear power technical specifications and standards, and passed complete type test.



KYN28A-12 铠装移开式交流金属封闭开关设备

主要技术参数

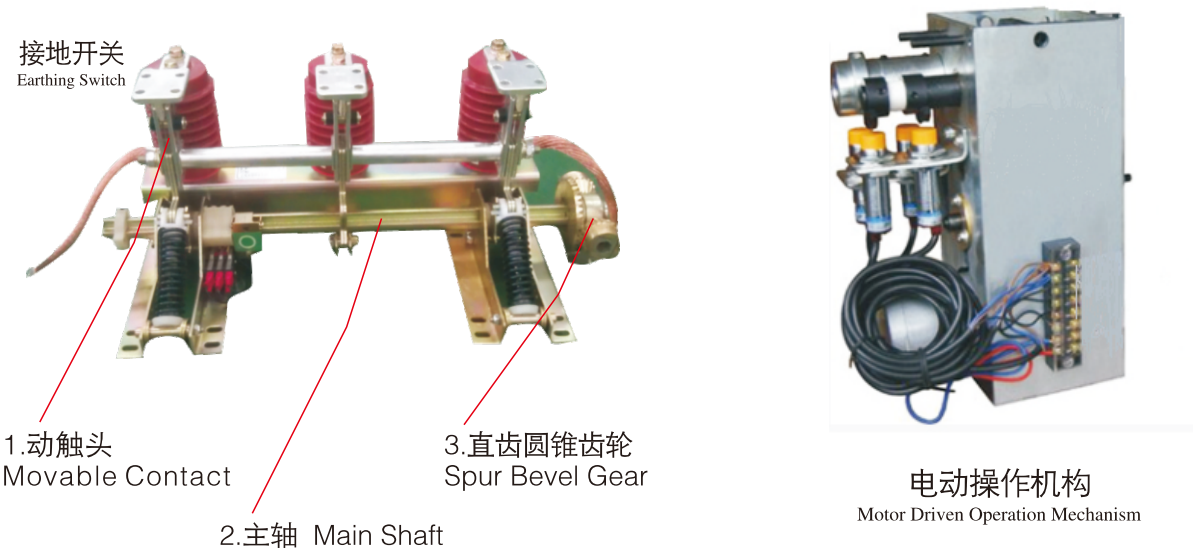
Main Technical Data

序号 No	项目 Item	单位 Unit	参数 Data
1	额定电压 Rated voltage	kV	12
2	额定绝缘水平 Rated insulation level		42/48
	雷电冲击耐受电压（峰值） Lightning impulse withstand voltage (peak)		75/85
3	额定频率 Rated frequency	Hz	50
4	额定电流 Rated current	A	630-4000
5	额定短路开断电流 Rated short circuit breaking current	kA	25-50
6	额定短时耐受电流（4S） Rated short time withstand current (4s)		25-50
7	额定峰值耐受电流 Rated peak withstand current		63-125
8	额定单个电容器组开断电流 Rated breaking current of single capacitor bank	A	630
9	额定背对背电容器组开断电流 Rated breaking current of back-to-back arranged capacitor bank		400
10	额定短路开断电流开断次数 Breaking times of rated short circuit breaking current	次 Times	50/30
11	机械寿命 Mechanical life		30000/20000
12	额定操作顺序 Rated operation sequence		O-0.3S-CO-180s-CO/O-180S-CO-180s-CO
13	额定操作电压	V	AC/DC220, AC/DC110

JN15-12D户内高压交流电动接地开关

Type JN15-12D Indoor AC High Voltage Motor-Driven Earthing Switch

1、接地开关描述 Description of Earthing Switch



KYN28A-12 铠装移开式交流金属封闭开关设备

- 1.1 JN15-12D户内交流高压电动接地开关是由电动操作机构和接地开关本体两部分组成，三相动触头固定于主轴上，触头之间用铜母线短接并接地，主轴通过一组直齿圆锥齿轮传动，接地开关操作机构同接地开关为分体式，手力操作可实现分合闸。
- 1.2 电动操作，源动力通过直流永磁减速电机减速装置输出，经过齿轮减速，传动至接地开关操作轴，以实现接地开关电动分合闸。机构中设置双向超越离合装置，实现正反方向转动超越离合，同时机构中，设置离合装置，实现电动、手动操作切换。
- 1.3 手动操作，电机断电后，手动操作接地开关，此时转矩输出不传递给电机，有效保护电机减速箱不受损坏。
- 1.4 接地开关传动机构通过了机械系统动力学自动分析软件ADAMS进行可靠性分析、验证。

- 1.1 Type JN15-12D indoor AC high voltage motor driven earthing switch is composed of the motor driven operation mechanism and the earthing switch . The three-phase movable contacts are fixed on the main shaft, and among the contacts copper busbars are used to short-circuited and earthed. The transmission of the main shaft is via a group of spur bevel gears. The mechanism and the earthing switch are independent, and the opening and closing can be realized manually.
- 1.2 For the motor driven operation, the driving force is output through the DC permanent-magnet gear motor and gear device, then after gear down it is transmitted to the operation shaft of the earthing switch to realize the electric opening and closing. The mechanism is equipped with double-direction overrunning clutch device to carry out the rotation overrunning clutch positively and negatively. And the mechanism is also equipped with clutch device to carry out the change between motor driven operation and manual operation.
- 1.3 For the manual operation, after the motor is power off, operate the earthing switch manually, at this time the torque output is not transmitted to the motor, which prevent the motor gear box from being damaged.
- 1.4 The transmission gear has been analyzed and verified by the automatic analyzing software ADAMS on dynamics in mechanical system.

2、控制模块描述 Description of controlling module

- 2.1 检测电机工作时电流大小，判断电动接地开关分合闸情况，根据本地或远程指令，对接地开关进行分合闸操作。
 - 2.2 可实现电机软起动，控制器设置电机堵转功能，一旦发现有堵转现象，则命令终止。有效降低电动执行机构堵转带来的风险。
 - 2.3 具有语言提示功能，方便用户了解操作、控制结果。
- 2.1 Inspect the working current of the motor to judge the opening and closing situation of the motor driven earthing switch, and to do opening and closing operation according to the local or remote order.
 - 2.2 The motor can be soft-start. The controller has blocked function, once there is blocked phenomenon, the order stops. As can reduce the risk caused by the block of the motor performing device.
 - 2.3 It has voice prompt function, which is more convenient for users to know result of operation and controlling.

表 1 电动接地开关技术参数
Table 1. Technical Parameter of Motor Driven Earthing Switch

名称 Description	单位 Unit	参数 Parameter	
额定电压 Rated voltage	kV	12	
额定雷电冲击耐受电压（配柜后） Rated lightning impulse withstand voltage (equipped with switchgear)	kV	75 (对地To-earth)	75 (对地To-earth)
1min工频耐受电压（配柜后） 1 Min. power frequency withstand voltage (Equipped with switchgear)	kV	42 (对地 To-earth)	42 (对地 To-earth)
额定频率 Rated frequency	Hz	50	
4S额定短时耐受电流 4S Rated short-duration withstand current	kA	31.5、40	
额定关合电流 Rated making current	kA	80、100	
机械寿命 Mechanical endurance	次 Cycle	3000	

表2 机械特性参数表
Table 2 Mechanical Property Parameter

名称 Description	单位 Unit	参数 Parameter
额定电压 Rated voltage	kV	12
相 距 Phase distance	mm	210、275
操作力矩 Operation torque	N.m	≤200
接触压力 Contacting pressure	N	400
同 期 性 synchronism	ms	≤ 2
开 距 Clearance between open contacts	mm	≥ 125

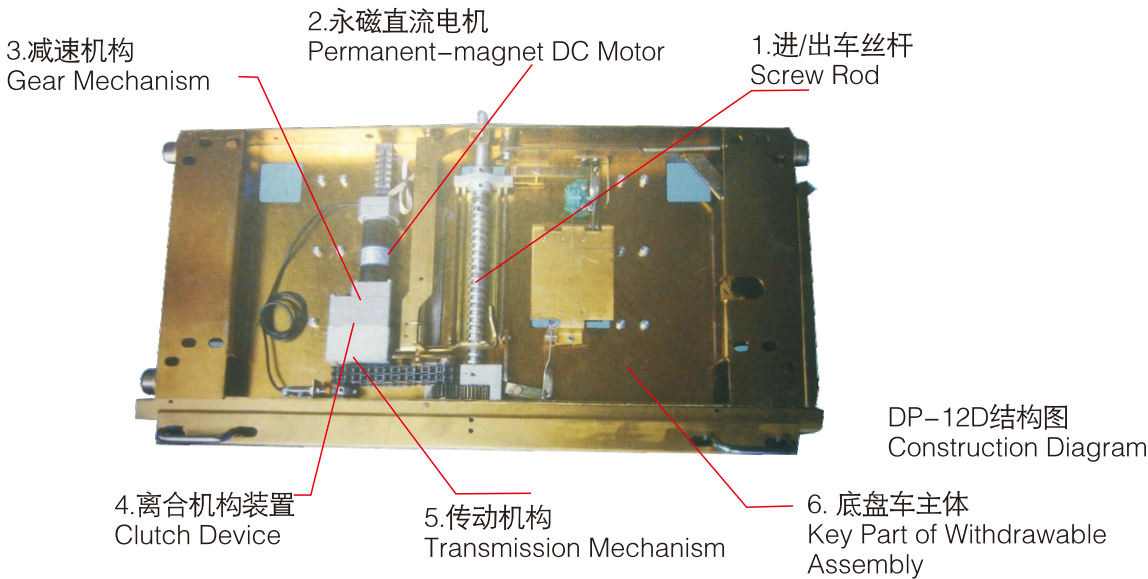
表 3电机的技术数据 Table 3 Technical Data of Motor

序号No.	名称 Description	单位 Unit	参数 Parameter
1	额定操作电压 Rated operation voltage	V	DC220/DC110
2	分、合闸操作电流 Operation current for opening and closing	A	1.2
3	功率 Power	W	120

DP-12D电动底盘车

Type DP-12D Motor-Driven Withdrawable Assembly

1、电动底盘车描述 Description of Motor Driven Withdrawable Assembly



电机2采用性能稳定、高可靠的永磁直流电机作为动力源输出。通过减速机构3变速以后电机输出转速为60圈/分钟，离合机构装置4满足电机转矩输出，输出转矩通过传动机构5传递给进/出车丝杆1，实现手车自动进车、退车。当人力对丝杆实施进车、退车操作，此转矩输出不传递给电机，有效保护电机减速箱不受损坏。

The motor 2 adopts reliable performance, high reliability DC permanent-magnet DC motor as the driving force output. The motor output speed is 60 cycles per minute after changing speed by gear mechanism 3.The clutch device 4 meets the requirement of motor torque output, and by the transmission mechanism 5 the output torque is transmitted to the screw rod 1 which performs function of making the trolley into/out of cubicle, then the trolley automatically moves into and out of the cubicle. When manually operate the screw rod to make the trolley move into or out of the cubicle, this torque output will not be transmitted to the motor, as effectively prevent the motor gear box from being damaged.

KYN28A–12 铠装移开式交流金属封闭开关设备

2、控制模块描述 Description of controlling module

- 2.1 检测电机工作时电流大小，判断手车进车、退车过程受阻力的情况。控制器设置电机堵转功能，有效降低电动执行机构堵转带来的风险。
- 2.2 可实现软启动和软停止,消除电动执行机构惯性影响，使控制过程更精准。
- 2.3 进车、退车过程中出现故障（如卡滞等），控制器根据设定的参数自动退回到安全位置或由操作人员发送退回指令。
- 2.4 具有语言提示功能，方便用户了解操作、控制结果。

- 2.1 Inspect the working current of the motor to judge the resistance situation during the into–cubicle and being pushed into cubicle of the trolley.
- 2.2 Soft start and soft stop can be carried out, so that the inertia effect of the motor enforcement mechanism can be removed. And then the controlling course is much more precise and correct.
- 2.3 If there are failure (such as clamping stagnation, etc) in the course of the trolley being pushed into or withdrawn out of cubicle, the controller will be back to the safe position according to the set out data or the operator sends retreat order.
- 2.4 It has voice prompt function, which is more convenient for users to know result of operation and controlling.

3、特点 Feature

- 3.1 通用性强，外形及安装尺寸与普通手动底盘车一致。
- 3.2 可与断路器、隔离手车、电压互感器车等配合，使多种用途的开关设备都能实现电动操作。
- 3.3 机构中装有离合装置，可实现电动和手动切换。
- 3.4 设置机械过载保护，在进车失败时，可保护电机不受损坏。
- 3.5 相比较于普通底盘车，传动更精确，减小进车时晃动。
- 3.6 电动进车传动机构通过了ADAMS(机械系统动力学自动分析)软件进行可行性分析。

- 3.1 More universal, same dimension and installation size as common manual withdrawable assembly
- 3.2 Be cable of coordinating with circuit breaker trolley, isolating trolley, PT trolley, etc, to make various kind of switchgear cubicles carry out motor driven operation.
- 3.3 The mechanism is equipped with clutch device, which can realize the change between motor driven operation and manual operation.
- 3.4 There is mechanical overload protection, and the motor can be prevented from being damaged if it is failed to make the trolley into cubicle.
- 3.5 Compared with the common withdrawable assembly, the transmission of this type of withdrawable assembly is more accurate which reduces the vibration when the trolley is moving into cubicle.
- 3.6 The motor driven transmission mechanism has been feasibility–analyzed by the automatic analyzing software ADAMS on dynamics in mechanical system.

KYN28A–12 铠装移开式交流金属封闭开关设备

4、电动底盘车主要参数 Main Parameter of Withdrawable Assembly

- 4.1 机械特性参数见表1
- 4.2 电机的技术数据见表2
- 4.1 Mechanical property parameter refers to Table 1.
- 4.2 Technical data of motor refers to Table 2.

表1 机械特性参数表 Table 1 Mechanical Property Parameter

项目名称 Description	单位 Unit	参数 Parameter	
		DP–12D/800	DP–12D/1000
配柜体宽度 Cubicle Width	mm	800	1000
电动提供摇进的最大转矩Max Torque	N. m	40	
电动摇进、摇出 Time for motor cranking into, cranking out	s	≤20	
机械寿命 Mechanical Endurance	次 Cycles	≥ 3000	≥ 3000

表2 电机的技术数据 Table 2 Technical Data of Motor

序号No.	项目名称 Description	单位Unit	参数 Parameter
1	额定操作电压 Rated operation voltage	V	DC220或DC110
2	额定转速 Rated speed	r/min	60
3	功率 Power	W	250
4	最大短时允许电流 Permissible Max. short–time current	A	DC220时2.5A；DC110时4.0A

开关柜布置及安装

Arrangement and Installation of Switchgear

配电室平面布置基本方案

Basic Floor Plan of Power Distribution Room

由于KYN28A-12型开关设备的安装，调试及操作均在正面进行，所以KYN28A-12型开关设备可以靠墙安装，以节省占地面积。但如果条件许可，仍建议开关柜后盖板到墙之间以及开关柜两侧到墙之间均留出适当的维修通道。

图A所示为配电室平面布置的参考方案，不论配电室是电缆沟引入方式或电缆下出线安装方式，以及电缆上出线方式均可参照本布置方案。下图表示开关设备单排列布置，若开关柜是双排对面布置，两排开关设备之间距离建议不小于2500mm。

The installation, commissioning and operation of switchgear are done in front of switchgear; the switchgear can be installed against wall to save floor space occupied. But if conditions permit, it is suggested that it is better to have proper operation aisle for overhauling between the back cover and the wall, between both sides and the wall.

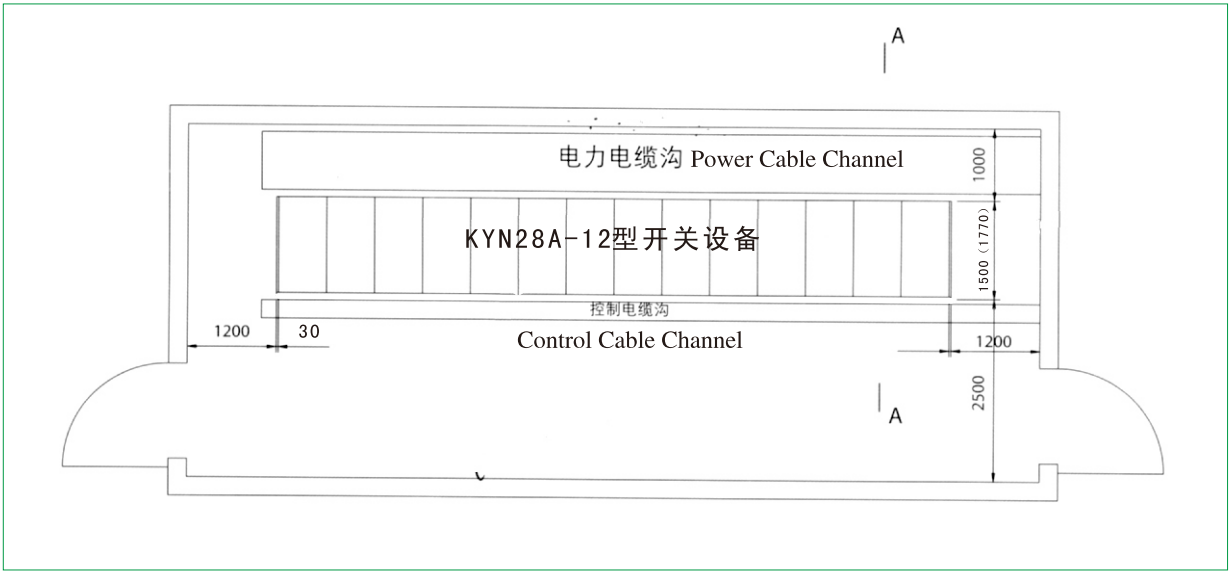
Fig A is the reference scheme for floor plan of power distribution room, it can be for cable channel incoming scheme, for cable bottom outgoing installation scheme, and for cable top outgoing scheme. The Figure just shows the single row arrangement of switchgears, if it is double rows of arrangement, the distance between them shall not be less than 2500mm.

开关设备基础埋设

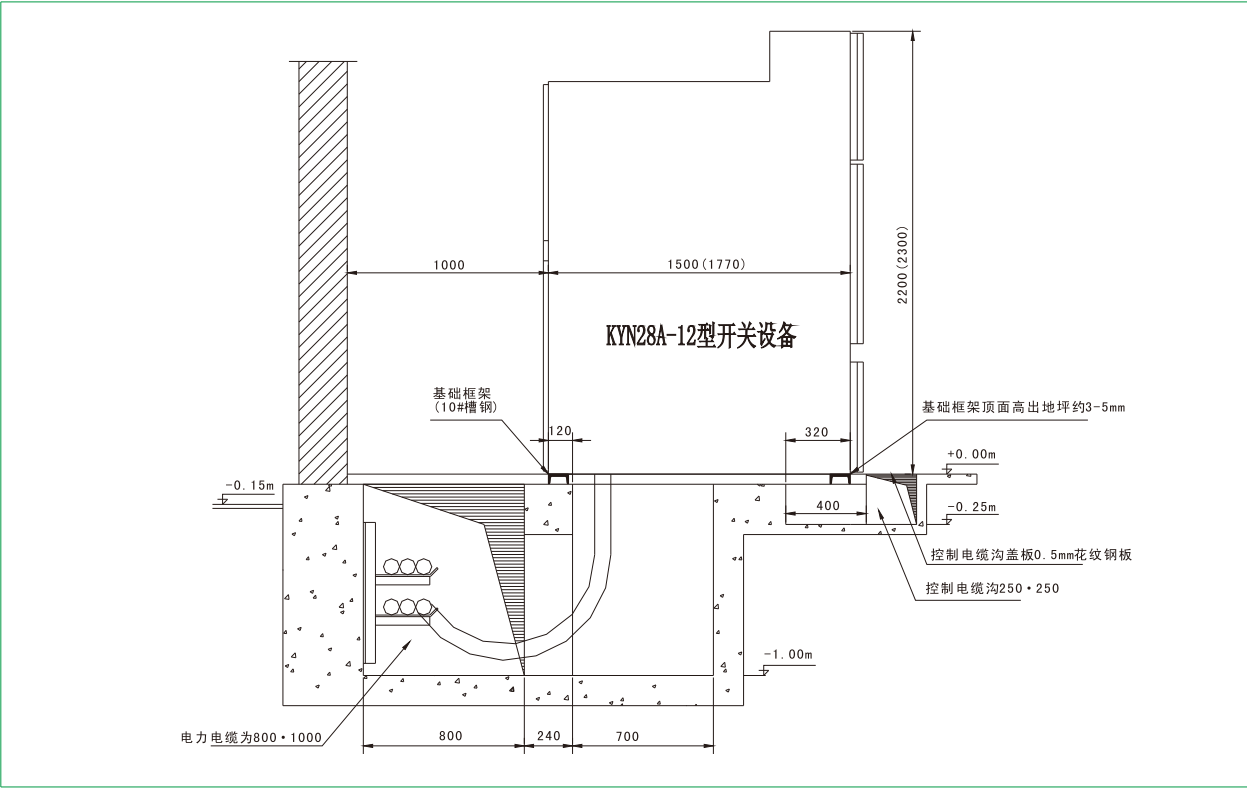
Foundation Embedment

开关设备基础的施工应符合电力建设施工及验收技术规范的有关条款的规定。不论采用哪一种进出线方式，KYN28A-12型开关设备的基础均建议采用预先加工好的框架式底座。

The foundation embedment of cubicle shall be in accordance with the concerned regulations of Erection and Acceptance of Electric Power Construction. No matter which kind of cable outgoing is adopted, it is suggested that the pre-made frame base is used for the foundation embedment.



图A配电室典型平面布置图 Fig A, Typical Floor Plan of Power Distribution Room



图B配电室典型剖面布置图 (图A的A-A剖视) Fig B, Typical Section Layout of Power Distribution Room

如图B所示。开关设备的基础框架埋设一般要求采取二次浇灌的方法，待土建施工完成之后由电气安装单位进行埋设。基础框架的制作应根据设计部门按制造厂要求绘制的图纸进行。

土建设计时开关设备基础标高应考虑预留基础框架槽钢的高度，并略有余量，见图B。并在开关设备基础上沿框架纵向方向每间隔1至1.5米预埋错固钢板。

基础框架主要采用10#槽钢，框架的基本尺寸要求及电缆沟道布置见图C。基础框架槽钢的外延距离应与开关设备本体框架尺寸一致，其数值为1500 (1770) mm。根据开关柜的平面布置情况及每排开关设备的台数决定框架的总长度。

基础框架预埋时应进行水平校准，要求水平误差及平直度不超过每米1毫米，总误差不超过2毫米。并要求基础框架的顶面比配电室最终地坪高出约3至5毫米。

While designing the civil engineering, the standard height of the cubicle foundation shall be considered to add the reserved height of foundation channel steel and there shall be some margin. Refer to Fig B And embed the anchoring steel plate on the frame vertically at every 1m or 1.5m span.

The foundation frame is mainly of 10# channel steel. The basic dimension of frame and cable channel arrangement, refer to Fig C The outside size of the channel steel for foundation frame shall be the same as the Switchgear cubicle, that is 1500(1770) mm. The total length of the frame depends on the floor arrangement and the quantity of each row of cubicles.

While embedding the foundation frame, the horizontal alignment shall be done. The horizontal error and glancing flatness shall be not over 1mm per meter, and the total error shall be not more than 2mm. It is required that the top of the foundation frame shall be 3mm to 5mm higher than the final ground of the power distribution room.

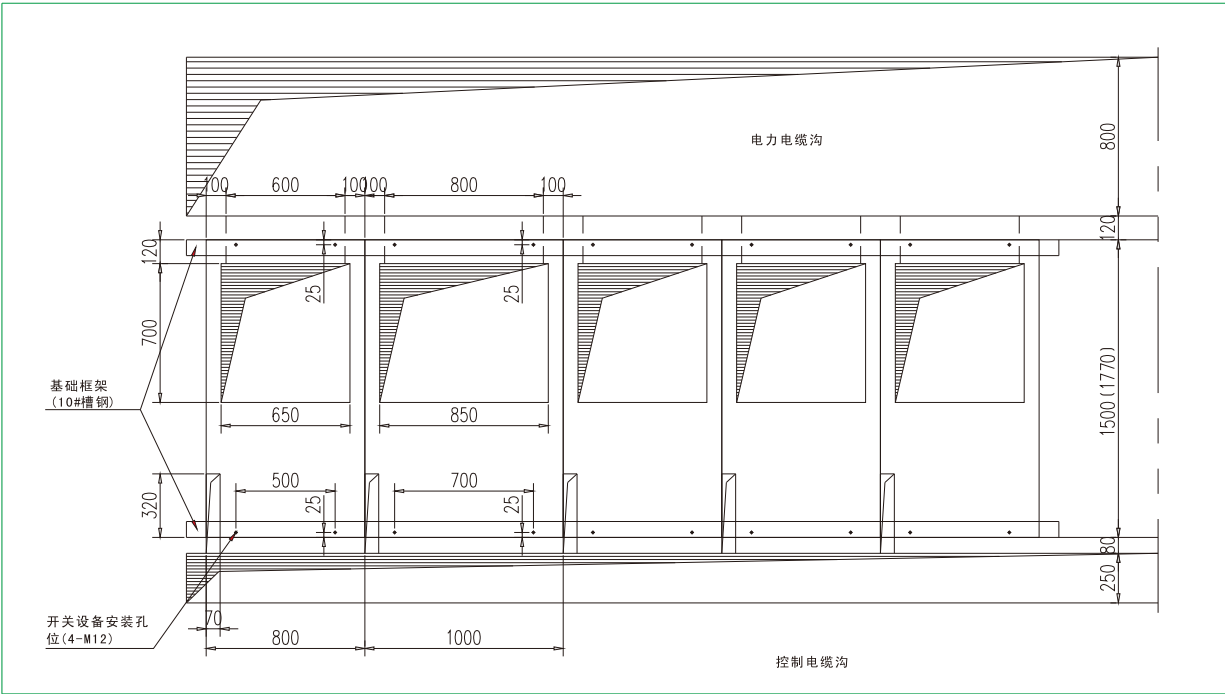
开关设备的安装

Installation of Switchgear

KYN28A-12型开关设备应安装在干燥，整洁，空气流通的配电室里。安装时，要求配电室内开关设备的基础框架及室内地坪已竣工验收。且配电室内的门窗装修及室内照明通风工程应基本完成。

开关设备的具体安装方法，另见《安装使用说明书》

Type KYN28A-12 switchgear shall be installed in the dry, clean power distribution room with good ventilation. While installing, the foundation frame and the ground construction is finished and have been accepted, and the decoration of doors and windows, lighting and ventilation engineering of the power distribution room almost is completed. For the details, please refer to the Installation and Service Manual.



图C配电室电缆沟道典型布置图 Fig C, Typical Arrangement Diagram of Cable Channel in PowerDistribution Room

运输和存放注意事项

Notice for transportation and storage

- a)开关设备在装卸、运输时不准倾翻、倒置和遭受剧烈振动，吊绳应置于包装箱或开关设备指定部位；
- b)防止雨淋，以免产品受潮；
- c)开关设备抵达现场时，收货人应检查货物外包装是否完整，货物有无受到损坏或短缺，必要时应通知供货方到现场共同检查；
- d)设备或开关设备的搁置应平稳，不得随意拆卸电器元件及零部件。

- a) It's not allowed to have the switchgear turned over, laid upside down and violently vibrated during loading & unloading and transportation And the lifting rope shall be put on specified place of the packing case or switchgear.
- b) To avoid raining so as to keep the products from damping
- c) The goods consignee shall check whether the packing is intact and goods are damaged or missed when the products are delivered to the site, if necessary, it should inform the supplier to perform check together on site.
- d) Products should be placed evenly, and it's not allowed to dismantle electric components and parts at will.

开关设备的调试

Commissioning of switchgear

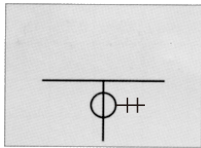
- a)检查隔离触头的插入深度和接触是否良好；
- b) 开关设备安装后要进行操作试验，手动操作断路器、手车和接地开关等部位，并检查机械联锁全部程序的操作，动作要准确，应灵活无卡滞现象；
- c) 检查断路器的机械特性是否符合规定要求，并按规定的最高、最低操作电压进行操作试验，合、分正常；
- d) 对二次回路进行通电实验，检查保护、控制和信号回路动作的正确性；
- e) 主回路电阻测量、断路器的回路电阻应不超过标准规定值；
- f) 主回路相间和相对地间工频耐压试验，按交接验收规定进行；
- g) 二次回路绝缘强度试验2000V1min.应无击穿闪络现象。二次回路中的电子器件部分，试验电压由用户与制造厂商定。

- a)To check whether the disconnecting contacts are inserted into the proper position and contact effectively.
- b) To perform the operation test after installation of switchgear, such as manually operating circuit breaker, truck and earthing switch, etc.; to check all the operation procedures of mechanical interlocking. And the action shall be accurate and flexible without block.
- c)To check whether the mechanical characteristics of circuit breaker complies with specified requirements, to perform operation test as per the specified max./min. operating voltage, and the opening and closing shall be normal.
- d) To perform energizing test on secondary circuits to check whether the protective, control and signal circuits can operate correctly.
- e) To measure the resistance of main circuit, and circuit resistance of circuit breaker should not exceed standard value.
- f) To carry out power frequency withstand voltage test on phase-to-phase of main circuit and phase-to-earth according to the acceptance provisions during handover.
- g) To do dielectric test on secondary circuits for 1 min. by applying 2000V, and there shall be without flashover. And the test voltage for electronic components of secondary circuits should be negotiated by user and manufacturer.

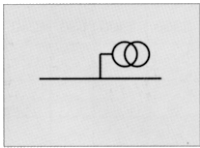
一次接线方案
Primary Wiring Scheme

母线应用单线图

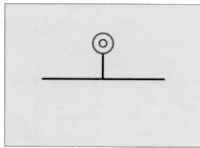
Busbar Legends



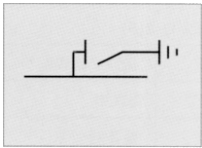
电流互感器
CT



电压互感器
PT



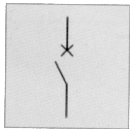
母线桥顶进
Overhead
Busbar Incoming



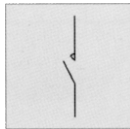
接地开关
Earthing Switch

符号说明

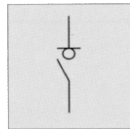
Symbol Description



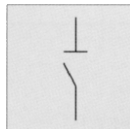
断路器
Circuit



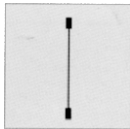
接触器
Contactor



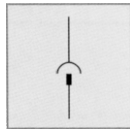
负荷开关
Load Break
Switch



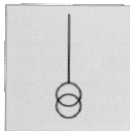
隔离开关
Disconnector



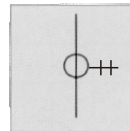
隔离排
Isolating
Busbar



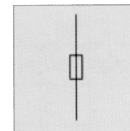
插头和插座
Plug and Socket



电压互感器
PT



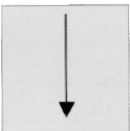
电流互感器
CT



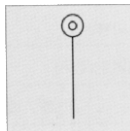
熔断器
Fuse



接地
Earthing
Switch



电缆进线
Cable
Incoming

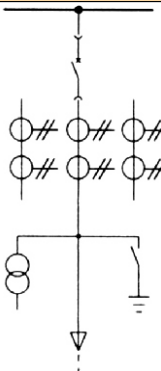
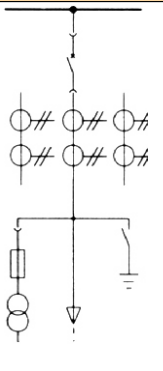
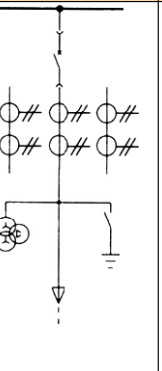
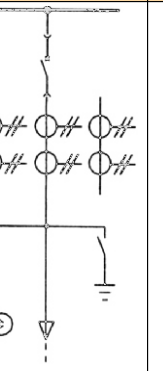
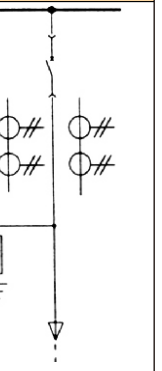


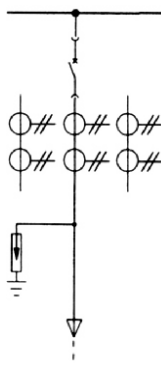
母线顶进
Overhead
busbar Incoming

进线柜或馈线柜方案——电缆进出线方式

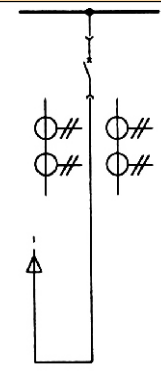
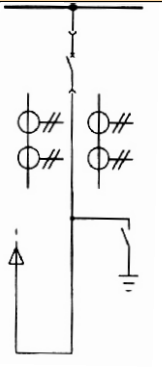
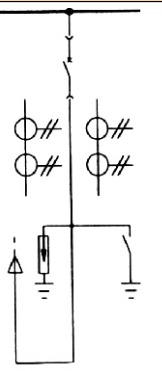
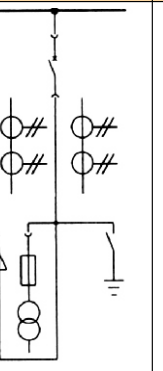
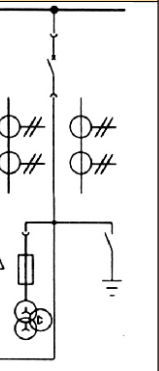
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主 接 线 方 案					
额定电流 (A)	630~4000	630~4000	630~4000	630~4000	630~4000
主 要 设 备	真空断路器	1	1	1	1
	电流互感器	2	2	2	2
	电压互感器			2	2
	高压熔断器				3
	接地开关	1	1	1	1
	避雷器		3		
带电显示器	按用户需要	按用户需要	按用户需要	按用户需要	按用户需要

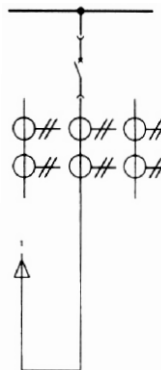
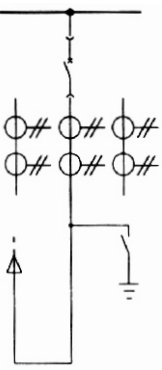
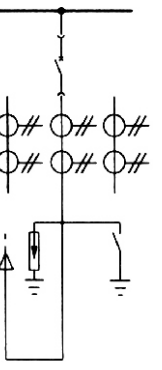
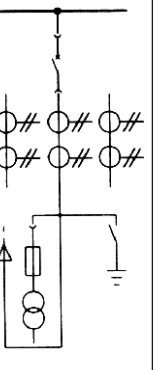
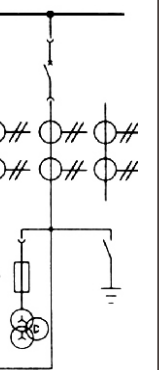
方案编号	006	007	008	009	010
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额定电流 (A)	630~4000	630~4000	630~4000	630~4000	630~4000
主 要 设 备	真空断路器	1	1	1	1
	电流互感器	2	2	3	3
	电压互感器	3	3		
	高压熔断器		3		
	接地开关	1	1	1	1
	避雷器				3
带电显示器	按用户需要	按用户需要	按用户需要	按用户需要	按用户需要

方案编号		011	012	013	014	015
主 接 线 方 案						
	额定电流 (A)	630~4000	630~4000	630~4000	630~4000	630~4000
主 要 设 备	真空断路器	1	1	1	1	1
	电流互感器	3	3	3	3	2
	电压互感器	2	2	3	3	
	高压熔断器		3		3	
	接地开关	1	1	1	1	
	避雷器					3
	带电显示器	按用户需要	按用户需要	按用户需要	按用户需要	按用户需要

方案编号		016	017	018	019	020
主 接 线 方 案						
	额定电流 (A)	630~4000				
主 要 设 备	真空断路器	1				
	电流互感器	3				
	电压互感器					
	高压熔断器					
	接地开关					
	避雷器	3				
	带电显示器	按用户需要				

进线柜或馈线柜方案——带后背包顶进出线方式

方案编号		021	022	023	024	025
主 接 线 方 案						
	额定电流 (A)	630~4000	630~4000	630~4000	630~4000	630~4000
主 要 设 备	真空断路器	1	1	1	1	1
	电流互感器	2	2	2	2	2
	电压互感器				2	3
	高压熔断器				3	3
	接地开关		1	1	1	1
	避雷器			3		
	带电显示器	按用户需要	按用户需要	按用户需要	按用户需要	按用户需要

方案编号		026	027	028	029	030
主 接 线 方 案						
	额定电流 (A)	630~4000	630~4000	630~4000	630~4000	630~4000
主 要 设 备	真空断路器	1	1	1	1	1
	电流互感器	3	3	3	3	3
	电压互感器				2	3
	高压熔断器				3	3
	接地开关		1	1	1	1
	避雷器			3		
	带电显示器	按用户需要	按用户需要	按用户需要	按用户需要	按用户需要

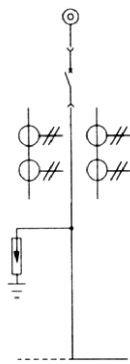
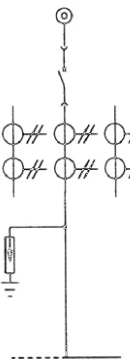
方案编号		031	032	033	034	035
主 接 线 方 案						
额定电流 (A)		630~4000	630~4000			
主 要 设 备	真空断路器	1	1			
	电流互感器	2	3			
	电压互感器					
	高压熔断器					
	接地开关					
	避雷器	3	3			
	带电显示器	按用户需要	按用户需要			

方案编号		036	037	038	039	040
主 接 线 方 案						
额定电流 (A)						
主 要 设 备	真空断路器					
	电流互感器					
	电压互感器					
	高压熔断器					
	接地开关					
	避雷器					
	带电显示器					

进线柜或馈线柜方案——母排顶进出线方式

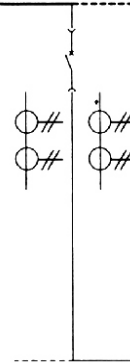
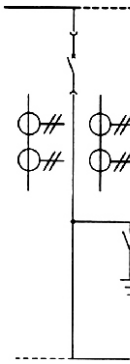
方案编号		041	042	043	044	045
主 接 线 方 案						
额定电流 (A)		630~4000	630~4000	630~4000	630~4000	630~4000
主 要 设 备	真空断路器	1	1	1	1	1
	电流互感器	2	2	2	3	2
	电压互感器				2	3
	高压熔断器				3	3
	接地开关		1	1	1	1
	避雷器			3		
	带电显示器	按用户需要	按用户需要	按用户需要	按用户需要	按用户需要

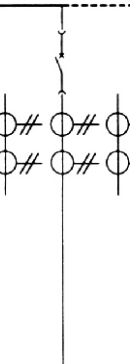
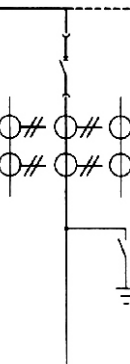
方案编号		046	047	048	049	050
主 接 线 方 案						
额定电流 (A)		630~4000	630~4000	630~4000	630~4000	630~4000
主 要 设 备	真空断路器	1	1	1	1	1
	电流互感器	3	3	3	3	3
	电压互感器				2	3
	高压熔断器				3	3
	接地开关		1	1	1	1
	避雷器			3		
	带电显示器	按用户需要	按用户需要	按用户需要	按用户需要	按用户需要

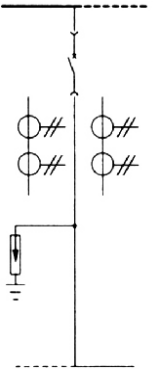
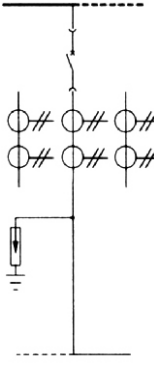
方案编号		051	052	053	054	055
主 接 线 方 案						
	额定电流 (A)	630~4000	630~4000			
主 要 设 备	真空断路器	1	1			
	电流互感器	2	3			
	电压互感器					
	高压熔断器					
	接地开关					
	避雷器	3	3			
	带电显示器	按用户需要	按用户需要			

方案编号		056	057	058	059	060
主 接 线 方 案						
	额定电流 (A)					
主 要 设 备	真空断路器					
	电流互感器					
	电压互感器					
	高压熔断器					
	接地开关					
	避雷器					
	带电显示器					

母联柜方案

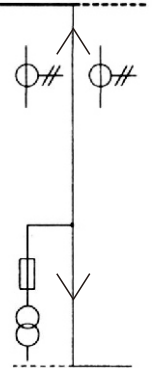
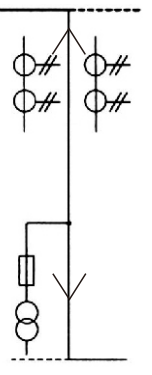
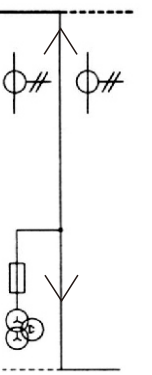
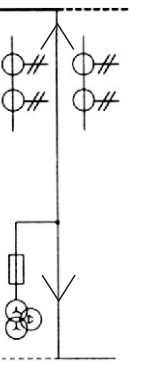
方案编号		061	062	063	064	065
主 接 线 方 案						
	额定电流 (A)	630~4000	630~4000	630~4000	630~4000	630~4000
主 要 设 备	真空断路器	1	1	1	1	1
	电流互感器	2	2	2	2	2
	电压互感器					3
	高压熔断器				3	3
	接地开关		1	1	1	1
	避雷器			3		
	带电显示器					

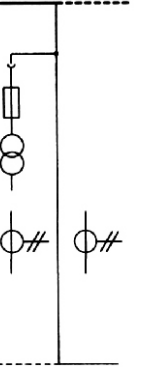
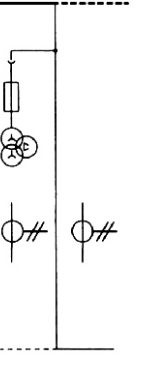
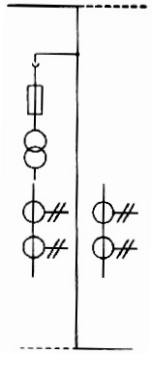
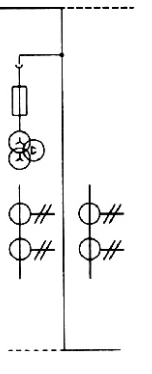
方案编号		066	067	068	069	070
主 接 线 方 案						
	额定电流 (A)	630~4000	630~4000	630~4000	630~4000	630~4000
主 要 设 备	真空断路器	1	1	1	1	1
	电流互感器	3	3	3	3	3
	电压互感器				2	3
	高压熔断器				3	3
	接地开关		1	1	1	1
	避雷器			3		
	带电显示器					

方案编号		071	072	073	074	075
主 接 线 方 案						
	额定电流 (A)	630~4000	630~4000			
主 要 设 备	真空断路器	1	1			
	电流互感器	2	3			
	电压互感器					
	高压熔断器					
	接地开关					
	避雷器	3	3			
	带电显示器					

方案编号		076	077	078	079	080
主 接 线 方 案						
	额定电流 (A)					
主 要 设 备	真空断路器					
	电流互感器					
	电压互感器					
	高压熔断器					
	接地开关					
	避雷器					
	带电显示器					

专用计量柜方案

方案编号		081	082	083	084	085
主 接 线 方 案						
	额定电流 (A)	630~1000	630~1000	630~1000	630~1000	
主 要 设 备	真空断路器					
	电流互感器	2	2	2	2	
	电压互感器	2	2	3	3	
	高压熔断器	3	3	3	3	
	接地开关					
	避雷器					
	带电显示器					

方案编号		086	087	088	089	090
主 接 线 方 案						
	额定电流 (A)	630~1000	630~1000	630~1000	630~1000	
主 要 设 备	真空断路器					
	电流互感器	2	2	2	2	
	电压互感器	2	2	3	3	
	高压熔断器	3	3	3	3	
	接地开关					
	避雷器					
	带电显示器					

电压测量柜方案



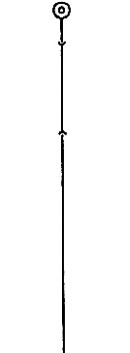

方案编号		091	092	093	094	095
主 接 线 方 案						
额定电流 (A)						
主 要 设 备	真空断路器VD4					
	电流互感器					
	电压互感器	2	3	2	3	
	高压熔断器	3	3	3	3	
	接地开关					
	避雷器			3	3	
	带电显示器					


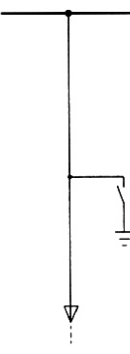
方案编号		096	097	098	099	100
主 接 线 方 案						
额定电流 (A)		630~2500	630~2500	630~3150	630~3150	630~3150
主 要 设 备	真空断路器VD4					
	电流互感器	2	3	2	2	3
	电压互感器	3	3	3	3	3
	高压熔断器					
	接地开关	3	3	3		
	避雷器					
	带电显示器					

方案编号		101	102	103	104	105
主 接 线 方 案						
额定电流 (A)		630~3150	630~3150	630~3150		
主 要 设 备	真空断路器VD4					
	电流互感器	2	3	3		
	电压互感器	3	3	3		
	高压熔断器					
	接地开关	3	3	3		
	避雷器					
	带电显示器					

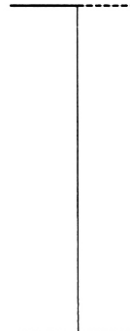
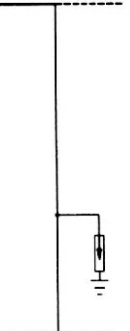
方案编号		106	107	108	109	110
主 接 线 方 案						
额定电流 (A)						
主 要 设 备	真空断路器					
	电流互感器					
	电压互感器					
	高压熔断器					
	接地开关					
	避雷器					
	带电显示器					

隔离柜及引线柜方案

方案编号		111	112	113	114	115
主 接 线 方 案						
	额定电流 (A)	630~4000	630~4000	630~4000	630~4000	630~4000
主 要 设 备	真空断路器					
	电流互感器					
	电压互感器					
	高压熔断器					
	接地开关					
	避雷器					
	带电显示器					

方案编号		116	117	118	119	120
主 接 线 方 案						
	额定电流 (A)	630~4000	630~4000			
主 要 设 备	真空断路器					
	电流互感器					
	电压互感器					
	高压熔断器					
	接地开关		1			
	避雷器					
	带电显示器					

母线提升柜方案

方案编号		121	122	123	124	125
主 接 线 方 案						
	额定电流 (A)	630~4000	630~4000			
主 要 设 备	真空断路器					
	电流互感器					
	电压互感器					
	高压熔断器					
	接地开关					
	避雷器		3			
	带电显示器					

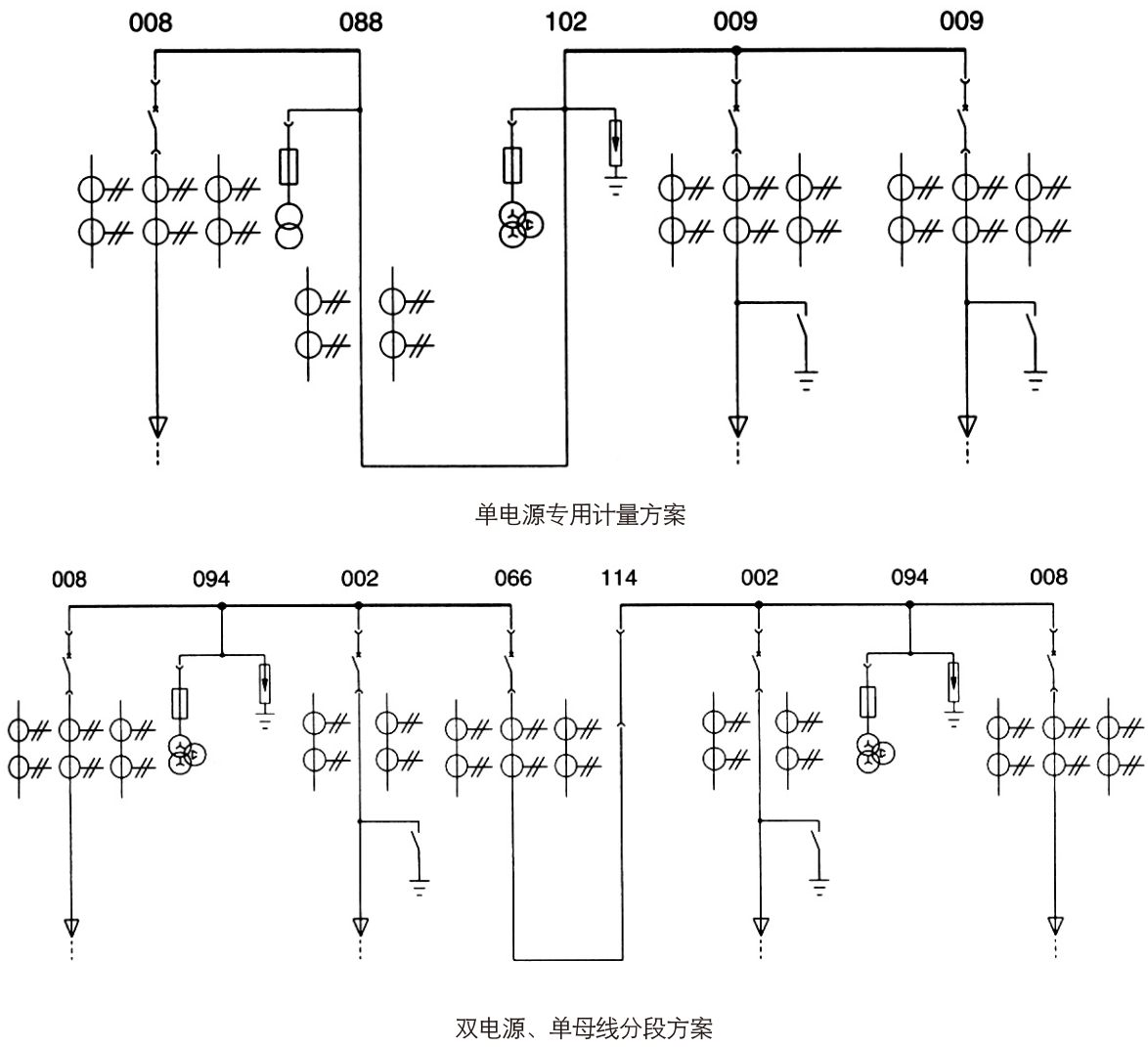
方案编号		126	127	128	129	130
主 接 线 方 案						
	额定电流 (A)					
主 要 设 备	真空断路器					
	电流互感器					
	电压互感器					
	高压熔断器					
	接地开关					
	避雷器					
	带电显示器					

配真空接触器VC方案

方案编号		131	132	133	134	135
主 接 线 方 案						
	额定电流 (A)					
主 要 设 备	真空断路器VC	1	1	1	1	
	电流互感器	2	3	2	3	
	电压互感器					
	高压熔断器	3	3	3	3	
	接地开关			1	1	
	避雷器			3	3	
	带电显示器					

方案编号		136	137	138	139	140
主 接 线 方 案						
	额定电流 (A)					
主 要 设 备	真空断路器					
	电流互感器					
	电压互感器					
	高压熔断器					
	接地开关					
	避雷器					
	带电显示器					

方案应用实列例



订货须知
Notice for order

订货时应提交如下资料

- a) 主接线方案图
- b) 开关设备排列和配电室平面布置图
- c) 开关设备内主要电器设备的型号、规格和数量
- d) 二次回路图
- e) 开关设备在特殊环境条件使用时，应在订货时说明
- f) 其他特殊要求。

The following information shall be provided for order:

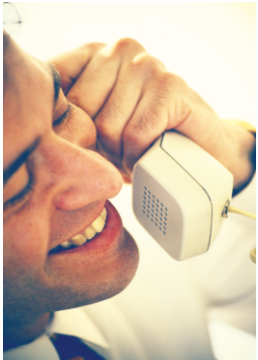
- a) Main wiring scheme
- b) Arrangement of switchgear and layout of power distribution room
- c) Model, specification and quantity of main electric components inside switchgear
- d) Secondary circuit diagram
- e) If switchgears are to be used in a special environment, it should specify clearly in order
- f) Other special requirements.



服务专线

 After-Sales Service Hotline

400-64-30001



客户反馈意见书
Feedback From Customers



服务方针 Principles of Service

以卓越的产品和服务，满足客户的要求和期望；
与客户、供应商紧密结合，建立合作伙伴关系，实现共同发展；
分布于国内各主要城市的服务网络，以及我们拥有的各种资源，是我们响应客户要求，赢得客户信任的关键。

Electric has meeting needs of clients with products of good quality and considerate services, and established partnership with clients and suppliers for common dev
Electric has providing services to clients through service networks in cities of China, gaining trust of clients.