MINGKONG

HIGH & LOW VOLTAGE SWITCHGEAR SELECTION GUIDE

Product range and technical specifications
Dimensions and operating conditions



Product family illustration



Power infrastructure concept illustration

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HENAN MINGKONG TECHNOLOGY CO., LTD.

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MKXB2

Prefabricated substation



产品概述/Product Overview

随着现代化城镇电网发展，以及国网公司建设世界一流能源互联网企业的战略目标推进。城市用电容量的不断上升，土地资源日趋紧张，对配电站（室）和配电设备小型化的要求越来越迫切。国家电网公司配网典型设计修订工作中增加了小型化开关站站型，优化后各类开关站平均可减少占地面积60%以上。

我公司研发的ZMXB2系列小型化智能预装式变电站模块化设计、结构简单、占地最少、安全可靠、免检修、少维护、符合环保要求、自动化和标准化程度高，外观形式多样化可以与周围环境协调。适用现代城市拥挤路段和一些相对比较狭小的空间，也符合电网公司配网自动化的标准需求。

With the development of modern urban power grids, and the strategic goals of State Grid Corporation is to build a world—class energy internet company. As urban electricity capacity continues to rise and land resources become increasingly tense, the requirements for miniaturization of substations (chambers) and power distribution equipment are becoming more and more urgent. The miniaturized switch station type has been added to the typical design revision work of the State Grid Corporation's distribution network. After optimization, the floor space of all kinds of switch stations can be reduced by more than 60%..

The ZMXB2 series miniaturized intelligent prefabricated substation developed by ourcompany has modular design, simple structure, minimum occupation, safety and reliability, less maintenance, environmental protection requirements, high degree of automation and standardization, and diversified appearances. Environmental coordination. Applicable to the crowded road sections of modern cities and some relatively small spaces, it also meets the standard requirements of grid company automation.

MKXB2小型化智能预装式变电站
Miniaturized Intelligent Prefabricated Substation

使用条件 / Conditions of Use

最高环境温度：+45℃；
最高月平均气温：+35℃；
最高年平均气温：+20℃；
最低环境气温：-15℃；
相湿度：最高月平均：90%（20℃）；
最高日平均：95%（20℃）；
污秽等级：Ⅲ级。

Maximum ambient temperature: +45°C;
Maximum monthly average temperature: +35°C ;
The highest annual average temperature: +20°C;
Minimum ambient temperature: -15°C;
Relative humidity: highest monthly average: 90% (20°C);
highest daily averag e： 95 %（20 ℃）；
Pollution level: Level Ⅲ.

产品特点/ProducrFeatures

本产品是美变替代型产品，占地面积小便于充分利用原有环境和基础进行升级改造，施工周期短投资省。欧式箱变结构设计，外观多样化，可以设计成与周围环境融合为一体的外观。内部设有通信室，可以实现远程操控和数据上传，提高运维检修效率。与美式箱变比，功能多、环网能力强，运行更稳定更安全。
标准化：方案统一、建设标准统一、模块化；
精益化：全密封、全绝缘、推广新技术、新工艺，提高设备运行水平；
外壳机构：采用不锈钢或者碳钢材料，防腐性能好；
外壳尺寸：2250×1300×2300（宽×深×高 单位mm）。

MKXB2 / YBMD

This product is a replacement for Combined substation(US). It has a small footprint and is easy to make full use of the original environment and foundation for uparading and transformation. The construction period is short and investment is saved. The European—style box has a variable structure design and a variety of appearances, which can be designed to integrate with the surrounding environment. The communication room is equipped with remote control and data uploading to improve operation and maintenance efficiency. Compared with the American box, it has many functions, strong ring network capability, and more stable and safe operation.
Standardization: unified program, unified construction standards, and modularization;
Lean: fully sealed, fully insulated, promote new technologies, new processes, improve equipment operation level;
Shell mechanism: purchase stainless steel or carbon steel materials, good corrosion resistance;
Shell size: 2250×1300×2300 (width×depth×height unit mm).

主要技术参数/Themaintechnicalparameters

项目Project				单位 Unit	参数Parameter		
高压侧额定电压Highvoltagesideratedvoltage				KV	10		20
高压侧最高电压Highvoltage sidehighestvoltage					12		24
低压侧额定电压 Low voltage side rated voltage				V	400		
变压器容量 Transformer capacity				KVA	30-630		
额定频率Ratedfrequency				Hz	50		60
额定峰值耐受电流Ratedpeakwithstandcurrent				kA	50		
1S短时耐受电流1Sshort-timewithstandcurrent					25		
额定绝缘水平 Rated insulation level	高压侧 High pressure side	雷电冲击耐受 Lightning impulse withstand	10kV	kV	75/85		
			20kV		125/45		
		1min工频耐受 Power frequency tolerance	10kV		42/48		
			20kV		65/79		
	低压侧 Low pressure side	额定电压Ratedvoltage		V	60≤UI≤300	300≤UI≤660	660≤UI≤800
		雷电冲击耐受电压 Lightning impulse withstand voltage			2500	6000	8000
		1min工频耐受电压 Power frequency withstand voltage			2000	2500	3000
	变压器 transfor-mer	高压侧最高电压 High voltage side highest voltage		KV	6	10	20
		低压侧额定电压 Low voltage side rated voltage			60	75	125
		1min工频耐受电压 Power frequency withstand voltage			25/20	35/28	55/50
外壳防护等级 Enclosure protection level					IP4X		

YBMD

Prefabricated substation



产品概述/Product Overview

YBMD-12/24系列地埋式箱式变电站简称地埋式箱变主体部分或全部埋入地下，是专门为市政设计的一款景观式供电设施。此款产品有效解决了城市用地紧张和城市牛皮癣的矛盾，占地很少，甚至不占地，视觉效果非常好与周边环境和谐统一，也可用作广告宣传布展使用。

YBMD—12/24 series underground box—type substation is called a buried—type box. The main part of the buried box is buried in the ground.It is a landscape—type power supply facility specially designed for the municipal government. This product effectively solves the contradiction between urban land tension and urban psoriasis.It occupies little or no land, and the visual effect is very good and harmonious with the surrounding environment.It can also be used for advert exhibition.

YBMD

YBMD-12/24 景观式地埋式箱变
Landscape Type Underground Box Change

型号含义 / Model meaning

YBMD - □ / □ - □
- 变压器额定容量Transformerratedcapacity
- 低压侧额定电压 Low voltage side rated voltage
- 高压侧额定电压Highvoltagesideratedvoltage
- 景观式地埋式箱变Landscapetypeundergroundboxchange

使用条件/Conditions of Use

最高月平均气温：+35℃;
最高年平均气温：+20℃;
最低环境气温：-15℃;
相对湿度：最高月平均：90%（20℃）；最高日平均：95%（20℃）；
污秽等级：Ⅲ级。

Maximum monthly average temperature: +35 C;
The highest annual average temperature: +20 C ;
Minimum ambient temperature:—15 C;
Relative humidity: highest monthly average: 90% (20°C); highest daily average: 95% (20°C);
Pollution level: Level lll .

产品特点/ProducrFeatures

外壳采用防腐不锈钢制作，密封采用优质航天级氧橡胶密封件，耐高温、耐腐蚀、无龟裂。高低压进出线采用独特的可分离拔插式终端连接，连接采用三相分仓共体形式。安装时同根电缆的三相带电体同时插入电缆连接器内，连接器内装有比水重的绝缘液体，有效的防止渗水的现象，改变了肘形拔插头与套管之间过盈密封时只能淋雨不能泡水的情况。整个产品全密封全绝缘防水性能好，产品允许短时间浸水工作，防护等级达到P68，使用寿命20年以上。

埋式箱变满足国家GB/T17467-1998《高压/低压预装式变电站》、DLT537-1993（6-35KV箱式变电站订货技术条件》等标准的要求，用于6-10kV环网可放射式电网的终端供电，广泛应用于城市建筑，生活小区，市政设施，矿山油田等。

The outer casing is made of anti—corrosion stainless steel, and the seal is made of high—quality aerospace qrade fluoro rubber seals. which are resistant to high temperature, corrosion and cracks. The high and low voltage inlet and outlet lines are connected by a unique detachable plug—in terminal, and the connection adopts a three—phase sub—compartment. during installation,the three—phase charged body of the same cable is inserted into the cable connector at the same time. The connector is filled with an insulating liquid heavier than water to effectively prevent water seepage and change the interference seal between the elbow—shaped plug and the sleeve, It cannot be soaked in rain. The whole product is fuly sealed and fully insulated. The product is allowed to be immersed in water for a short period of time. The protection grade is IP68 and the service life is more than 20 years.

Buried tanks meet the requirements of national GB/T17467-1998 "high-voltage /low-voltage prefabricated substation", DL/T537—1993"6—35kV box—type substation ordering technical conditions"and other standards, for 6— 10kV ring network The terminal power supply of the radial power grid is widely used in urban buildings, living quarters, municipal facilities, mining oil fields,etc.

YB

Prefabricated substation



产品概述/Product Overview

YB口-12/0.4（F.R）高、低压预装式变电站（欧式）广泛用于城市电网改造、住宅小区、高层建筑、工矿、宾馆、商场、机场、铁路、油田、码头、高速公路以及临时性用电设施等户内外场所。

本产品符合下列标准：

GB/T17467-1998《高压/低压预装式变电站》

DL/T537-93（6-35kV箱式变电站订货技术条件》

YB□-12/0.4 (F.R) High and low voltage prefabricated substations (European) are widely used in urban power grid reconstruction, residential quarters, high—rise buildings, industrial and mining operations, hotels, shopping malls, airports, railways, oil fields, terminals, highways And indoor and outdoor places such as temporary power facilities.

This product meets the following standards：

GB/T17467-1998《High voltage/low voltage prefabricated substation》

DL/T537-93《Technical Conditions for Ordering 6-35kV Box-type Substation》

YB□-12/0.4 高/低压预装式变电站（欧式）

High / Low Voltage Prefabricated Substations(European)

型号含义 / Model meaning

Y B □ - 12/0.4 - □

- 额定容量RatedCapacity
- 额定电压（高压/低压）Ratedvoltage（highvoltage/lowvoltage）
- 设计序号DesignNumber
- 变电站Substation
- 预装式Preloaded

使用条件/Conditions of Use

海拔高度不超过2000m；

环境温度：-25℃~+40℃；

相对湿度：在25℃时，日平均值不大于95%，月平均值不大于90%；

安装场所：无火灾、爆炸危险、导电尘埃、化学腐蚀性气体及剧烈震动的场所，若超出以上条件时，用户可与我公司协商。

The altitude does not exceed 2000m;

Ambient temperature: -25°C~+40°C;

Relative humidity: at 25 °C , the daily average is not more than 95%, and the monthly average is not more than 90%;

Installation site: no fire, explosion hazard, conductive dust, chemical corrosive gas and severe vibration. if the above conditions are exceeded, the user can consult our company.

负荷开关技术参数/Loadswitchtechnicalparameters

项目Project	单位 Unit	FKN12-12负荷开关 Load switch	FZN25-12真空负荷开关 Vacuum load switch
额定电压Ratedvoltage	kV	10	
最高工作电压Maximumworkingvoltage	kV	12	
额定频率Ratedfrequency	Hz	50	
额定电流Ratedcurrent	A	630	
额定开断负荷电流Ratedbreakingloadcurrent	A	630	
热稳定电流（有效值） Thermally stable current (effective value)	kA/S	20/2	20/4
动稳定电流 Dynamic steady current	kA	50	50
短路关合电流（蜂值） Short circuit closing current (peak)	kA	50	50
满负荷开断次数 Full load breaking times	次	20	10000
机械寿命 Mechanical life1min	次	2000	10000
1min工频耐压（相间及对地） Power frequency withstand voltage (interphase and ground)	kV	42	42
雷电冲击电压（相对及对地） Lightning impulse voltage (relative to ground)	kV	75	75

YB□-12/0.4 高/低压预装式变电站（欧式）

High / Low Voltage Prefabricated Substations(european)

















MKGF28

Combined substation



产品概述/Product Overview

本产品是吸取国外最新先进技术，结合国内实际情况研制开发的，整台产品具有体积小、安装维护简便、低噪音、低损耗、防盗、过负荷能力强、全保护等特点。适用于新建小区、绿化带、公园、车站宾馆、工地、机场等场所。

MKGF28-12/0.4组合式箱式变电站（美式），适用于10kV环网供电，双电源供电或终端供电系统中，作为变电、计量、补偿控制和保护装置。

本产品符合下列标准：GB/T17467-1998《高压低压预装式变电站》；DL/T537-93《6-35kV箱式变电站订货技术条件》。

This product is developed by absorbing the latest foreign advanced technology combined with actual domestic conditions. The product has the characteristics of small size, simple installation and maintenance, low noise, low loss, anti—theft, strong overload capacity and full protection. It is applicable to new residential areas, green belts, parks, station hotels, construction sites, airports and other places.

ZMGF28-12/0.4 combined box-type substation(US), suitable for 10kV ring network power supply, dual power supply or terminal power supply system, as a substation, metering, compensation control and protection device.

This product meets the following standards: GB/T17467-1998"High-voltage low-voltage prefabricated substation"; DL/T537—93"6—35kV box—type substation ordering technical conditions".

MKF28-12/0.4 组合式变电站（美式）

Combined substation(US)

型号含义 / Model meaning

MK GF 28 □ / □ □

- 变压器容量Transformercapacity(kVA)
- 低压侧额定电压Lowvoltagesideratedvoltage（kV）
- 高压侧额定电压Highvoltagesideratedvoltage(kV)
- 设计序号DesighNumber
- 预装式变电站（美式）Prefabricatedsubstation（US）
- 企业代号Enterprisecode

使用条件/Conditions of Use

海拔高度不超过1000m；

环境温度：-35℃~+40℃；

相对湿度：日平均值不大于95%，月平均值不大于90%；

安装场所：无火灾、爆炸危险、化学腐蚀性气体及通风良好的场所，地面倾斜不大于3°。

The altitude does not exceed 1000m;

Ambient temperature: -35°C~+40°C;

The daily average is not more than 95%, and the monthly average is not more than 90%;

Installation site: no fire, explosion hazard, chemical corrosive gas and well ventilated place, the ground inclination angle is not more than3°.

负荷开关技术参数/Loadswitchtechnicalparameters

项目Project	单位 Unit	参数 Parameter
额定电压Ratedvoltage	kV	10/0.4（高压/低压 High pressure/low pressure）
最高工作电压Maximumworkingvoltage	kV	12（高压侧 High pressure side）
额定频率Ratedfrequency	Hz	50

MKGF28 / YB33

额定容量Ratedcapacity	kVA	50-1600
1分钟工频耐压 1 Minute power frequency withstand voltage	kV	35
雷电冲击电压Lightningimpulsevoltage	kV	75
冷却方式 Cooling method		油浸自冷 Oil immersed from cold
高压后备熔断器开断电流 High voltage backup fuse breaking current	kA	50
插入式熔断器开断电流 Plug-in fuse breaking current	kA	2.5
环境温度Ambienttemperature	℃	-35~+40
线圈允许温升 Coil allows temperature rise	°C	65
无载调压 Unloaded voltage regulation		±5%或±2×2.5%
噪声等级 Noise level	db	50
防护等级 Protection level		IP43

YB33

Prefabricated substation



产品概述/Product Overview

YB33系列风力发电箱式变电站（以下简称箱变）是一种将风电机组发出的0.6~0.69kV电压升高到35KV后，并网输出的专用设备。该产品是我公司对应近海风电场单机容量大，防护高的要求开发的新产品。

Yb33 series wind power box type substation (hereinafter referred to as box change) is a special equipment for connecting the grid output,after raising the voltage of 0.6—0.69kV from the wind turbine to 35kV. This product is a new product developed by our company for the requirements of large offshore wind farms with high capacity and high protection.

YB33 光伏(风力)发电箱式变电站

Photovoltaic(wind)power generation box substation

型号含义 / Model meaning

YB 33 - 40.5 / 0.69 - □

- 变压器容量Transformercapacity
- 低压侧额定电压 Low voltage side rated voltage
- 高压侧额定电压Highvoltagesideratedvoltage
- 设计序号DesighNumber
- 光伏（风力）发电箱式变电站 Photovoltaic (wind) power generation box substation

YB33

使用条件/Conditions of Use

海拔高度不超过2500m；

环境温度：-45℃~+45℃；

相对湿度：日平均值不大于95%，月平均值不大于90%；

安装场所：无火灾、爆炸危险、导电尘埃、化学腐蚀性气体及剧烈震动的场所，若超出以上条件时，用户可与我公司协商。

• The altitude does not exceed 2500m;

Ambient temperature:-45°C ~+45°C;

The daily average is not more than 95%, and the monthly average is not more than 90%;

Installation site: no fire, explosion hazard, conductive dust, chemical corrosive gas and severe vibration. if the above conditions are exceeded, the user can consult our company.

产品特点/Features

●高压开关设备、变压器、低压开关设备三位一体，成套性强；低损坏、低噪音、性能优越，箱体采用防盗结构。

高、低压保护完善，运行安全可靠，维护简单：接线方案灵活多样。

高压一般采用负荷开关熔断器组合电器保护，熔断器一相熔断后，三相联动脱扣，负荷开关有真空、六氟化硫等型式可选，可配电动操作机构，实现自动化升级；熔断器为高压限流熔断器，带撞击器，动作可靠，开断容量大，主要技术参数。高压负荷开关推荐选用真空负荷开关产品，弹簧操动机构采用AC220V操作，能加装箱变保护装置，轻重瓦斯接口；并按变压器容量配熔断器，带避雷器及带电显示装置。组合电器真空灭弧室和隔离刀闸、接地刀闸之间具有可靠的机械联锁，只有在真空灭弧室处于分闸状态下时，才能够操作隔离刀闸和接地刀闸，隔离刀闸与接地刀闸联动。熔断器的脱扣装置为三极联动，所配用的熔断器为撞针式熔断器。撞击器可以直接分断负荷开关，确保能快速切断故障。

低压侧主开关采用万能式或智能型断路器，选择性保护。

选用低损耗、油浸式、全密封S9、S10、S11系列变压器，也可选用树脂绝缘或NOMEX纸绝缘环保型干式变压器，底部均配有小车，变压器可方便地进出。

High—voltage switchgear, transformer, low—voltage switchgear, three—in—one, strong set; low damage, low noise, superior performance, the cabinet uses anti—theft structure.

High and low voltage protection, safe and reliable operation, simple maintenance: flexible wiring scheme.

The high voltage is generally protected by the combination of load switch fuses. After the fuse is blown by one phase, the three—phase linkage is tripped.

The load switch is available in vacuum or sufur hexachloride. It can be equipped with an electric operating mechanism to achieve automatic upgrade. The fuse is a high—voltage current—limiting fuse with a striker, reliable operation, large breaking capacity, and main technical parameters. The high—voltage load switch is recommended to use vacuum load switch products. The spring operating mechanism adopts AC220V operation， and can be equipped with box—changing protection device， light and heavy gas interface; and the transformer capacity is equipped with fuses, with lightning arrester and live display device. There is a reliable mechanical interlock between the vacuum interrupter of the combined appliance and the isolation knife gate and the grounding knife gate. Only when the vacuum interupter is in the open state, the isolation knife switch and the grounding knife switch can be operated, and the knife gate is isolated. Linked to the grounding knife. The trip device of the fuse is a three—pole linkage, and the fuse used is a striker fuse. The impactor can directly disconnect the load switch, ensuring that the fault can be quickly shut off.

The low—voltage side main switch adopts universal or intelligent circuit breaker for selective protection.

Low-loss, oil-immersed, fully-sealed S9,S10,S11 series transformers are also available. Resin-insulated or NOMEX paper-insulated environmentally—friendly dry—type transformers are also available. The botom is equipped with a small car, and the transformer can be easily accessed.

KYN61-40.5

Product series



产品概述/Product Overview

KYN61-40.5铠装式金属封闭开关设备（简称开关柜）系我厂在原产品的基础上设计改进的开关设备。它适应于三相交流50Hz电力系统，用于接受和分配电能并对电路进行控制、保护及监测。
本开关柜具有各种防止误操作的功能，包括防止带负荷移动手车，防止带电合接地开关和防止误入带电间隔等功能。
本开关柜内配置性能优良的ZN85口VN1真空断路器或ABB公司VD4口HD4系列真空断路器。开关柜是技术先进、性能稳定、结构合理、使用方便、安全可靠的配电设备。

KYN61—40.5 armored metal—enclosed switchgear(referred to as switchgear) is our factory designed and improved switchgear based on the original product. It is adapted to a three-phase AC 50Hz power system for receiving and distributing electrical energy and for controlling, protecting and monitoring the circuit.
The switchgear has various functions to prevent misoperation, including preventing the handcart from moving with load, preventing the grounding switch from being energized, and preventing the charging interval from being mistaken.
This switchgear is equipped with ZN85, VN1 vacuum circuit breakers with excellent performance or ABB VD4 and HD4 series vacuum circuitbreakers. The switchgear is a power distribution equipment with advanced technology, stable performance and a reasonable structure. Also, it is safe reliable and convenient for use.

KYN61-40.5 铠装金属封闭开关设备
Armored metal enclosed switchgear

型号含义 / Model meaning

K Y N 61 - 40.5 □ □ □

- 额定短路开断电流Ratedshort-circuitbreakingcurrent（KA）
- 额定电流Ratedcurrent
- 断路器种类Z真空SF6六氟化硫CircuitbreakertypeZvacuumSF6sulfurhexafluoride
- 额定电压Ratedvoltage（kV）
- 设计序号DesignNumber
- 户内 Indoor
- 移开式Removetype
- 金属铠装式 Metal armored

使用条件/Conditions of Use

海拔高度不超过1000m；
环境温度：-25℃~+40℃；
相对湿度：日平均值不大于95%，月平均值不大于90%；
安装场所：没有易燃性气体、爆炸危险、严重污秽、化学腐蚀及经常性剧烈震动的场所。

• The altitude does not exceed 1000m;
Ambient temperature: -25°C~+40°C;
The daily average is not more than 95%, and the monthly average is not more than 90%;
There are no flammable gases, explosion hazards, serious contamination, chemical corrosion and frequent severe vibrations.

特殊使用环境条件/Specialuseenvironmentalconditions

当开关柜使用于超过本使用说明书规定的正常环境条件下时，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，开关柜设有加热器。当开关柜处于备用状态时，即应投入使用。即使在正常运行中，也应该注意投用。
开关柜的散热问题可通过附加的通风设施来解决。

When the switchgear is used under normal environmental conditions as specified in this instruction manual, the company and the user may negotiate and agree on special operating conditions that exceed normal operating conditions.
In order to prevent condensation, the switch cabinet is equipped with a heater. When the switchgear is in standby, it should be put into use.Even in normal operation, you should pay attention to the application.
The heat dissipation problem of the switchgear can be solved by additional ventilation.

主要特点/Mainfeature

柜体采用敷铝锌板经数控设备加工成型后，用螺栓拼接或铆接而成，结构为全拼装式。
可同时配装ZN85-40.5真空断路器手车、VN1、VD4或HD4真空断路器手车，开关柜主母线贯通无需过渡柜转接。
电缆室空间充裕，相间可保证空气净距大于300mm，相间无需加装绝缘隔板。

The cabinet is made of aluminum—zinc plate and processed by CNC equipment. It is formed by bolting or riveting. The structure is fully assembled.
It can be equipped with ZN85-40.5 vacuum circuit breaker handcart, VN1, VD4 or HD4 vacuum circuit breaker handcart. The main busbar of the switchgear can be connected without transition cabinet.
The space of the cable room is sufficient, and the air clearance can be ensured to be more than 300mm. There is no need to install insulation spacers between the phases.

KYN61-40.5 铠装金属封闭开关设备
Armored metal enclosed switchgear

技术参数/Technicalparameters

开关柜主要技术参数 / Main technical parameters of switchgear　　强迫风冷 Forced air cooling ※

项目Project		单位Unit	参数 Parameter
额定电压Ratedvoltage		kV	40.5
额定绝缘水平 Rated insulation level	1min工频耐受电压 Power frequency withstand voltage	kV	95（隔离断口 Isolation fracture 115）
	雷电冲击耐受电压（峰值） Lightning impulse withstand voltage (peak)	kV	185（隔离断口 Isolation fracture 115）
额定频率Ratedfrequency		Hz	50
主母线额定电流Mainbusbarratedcurrent		A	630~2500 3150※
额定短路开断电流Ratedshort-circuitbreakingcurrent		A	31.5
额定短时耐受电流 Rated short-time withstand current (4s)		kA	25
额定峰值开断电流 Rated peak withstand current		kA	31.5
辅助控制回路额定 Auxiliary control loop rating		V	25

KYN61-40.5 / XGN17-40.5

ZN85-40.5真空断路器技术参数 / Vacuum circuit breaker technical parameters

强迫风冷 Forced air cooling ※

项目Project		单位 Unit	参数 Parameter	
额定电压Ratedvoltage		kV	40.5	
额定绝缘水平 Rated insulation level	1min工频耐受电压 Power frequency withstand voltage	kV	95（隔离断口 Isolation fracture 115）	
	雷电冲击耐受电压（峰值） Lightning impulse withstand voltage (peak)	kV	185（隔离断口 Isolation fracture 115）	
额定频率Ratedfrequency		Hz	50	
额定电流Ratedcurrent		A	600、1000、1250、1600	1250、1600、2000 2500、3150※
额定短路开断电流Ratedshort-circuitbreakingcurrent		A	25	31.5
额定峰值耐受电流 Rated peak withstand current		kA	63	80
额定操作顺序Ratedoperationsequence			分(O)-0.3s-合分(CO)-180s合分(CO)	
额定短路开断电流开断次数 Rated short-circuit breaking current breaking times		次	20	
额定电缆充电开断电流Ratedcablechargingbreakingcurrent		A	25	
额定电容器组开断电流Ratedcapacitorbankbreakingcurrent		A	400	
容性电流开合性能Capacitivecurrentopeningandclosingperformance		级	C2	
合闸时间Closingtime		ms	40~100	
分闸时间Openingtime		ms	30~60	

VD4真空断路器技术参数/Vacuumcircuitbreakertechnicalparameters

强迫风冷Forcedaircooling

项目Project		单位Unit	参数Parameter
额定电压Ratedvoltage		kV	40.5
额定绝缘水平 Rated insulation level	1min工频耐受电压 Power frequency withstand voltage	kV	95（隔离断口 Isolation fracture 115）
	雷电冲击耐受电压（峰值） Lightning impulse withstand voltage (peak)	kV	185（隔离断口 Isolation fracture 115）
额定频率Ratedfrequency		Hz	50
额定电流Ratedcurrent		A	1250、1600、2000、2500、3150※
额定短路开断电流Ratedshort-circuitbreakingcurrent		A	31.5

XGN17-40.5

Product series



产品概述/Product Overview

XGN17-40.5箱型固定式交流金属封闭开关设备是根据GB3906-2006《3.6kV~40.5kV交流金属封闭开关设备和控制设备》进行设计。其外壳符合GB4208-2008规定的IP2X防护等级。
本开关设备系三相交流50Hz单母线及带母线旁路系统的户内成套装置，作为接受和分配35kV的网络电能之用。

XGN17-40.5box type fixed AC metal-enclosed switchgear is designed according to GB 3906-2006 "3.6kV-40.5kV AC metal—enclosed switchgear and control equipment".Its outer casing meets the IP2X protection rating specified in GB 4208-2008.
The switchgear is a three-phase AC 50Hz single busbar and an indoor unit with a busbar bypass system for receiving and distributing 35kV network power.

XGN17-40.5

XGN17-40.5 箱型固定式交流金属封闭开关设备

Box type fixed AC metal-enclosed switchgear

型号含义 / Model meaning

X G N 17 - 40.5 □ □ □

- 方案号Plannumber
- 额定短路开路电流Ratedshortcircuitopencurrent（kV）
- 额定电流Ratedcurrent（A）
- 额定电压Ratedvoltage（kV）
- 设计序号DesignNumber
- 户内 Indoor
- 固定式Fixed
- 箱型交流金属封闭开关设备 Box type AC metal-enclosed switchgear

使用条件/Conditions of Use

海拔高度不超过1000m；
环境温度：-5℃~+40℃；
相对湿度：日平均值不大于85%，（+25℃时）；
地震烈度：没有剧烈震动和颠簸及垂直倾斜不超过5°的场所；
环境条件：没有爆炸危险的场所。

Altitude: no more than 1000m;
Ambient temperature: upper limit + 40 ℃， lower limit—5 ℃；
Relative humidity: the daily average is not more than 85%,(+25°C);
Seismic intensity: no violent vibration and bumps and vertical tilting of no more than 5 degrees;
Environmental conditions: Locations where there is no danger of explosion.

技术参数 / Technical parameters

项目Project	单位 Unit	参数Parameter
额定电压Ratedvoltage	kV	40.5
最大额定电流Maximumratedcurrent	A	2000
额定开断电流Ratedbreakingcurrent	KA	25、31.5
额定关合电流（峰值）Rated closing current (peak)	KA	63、80
极限通过电流峰值Limitcurrentpeak	KA	63、80
额定短时耐受电流 Rated short-time withstand current (4s)	KA	25、21.5
外形尺寸（宽×深x高）Dimensions（W×D×H）	mm	1918×3250×3125
防护等级Protectionlevel		IP2X
重量Weight	kg	≈1500

KYN28A-24

Product series



产品概述/Product Overview

KYN28A-24型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、额定电压24kV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-24型开关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。开关设备配置性能优良的VS1、VN2系列中置式高压交流真空断路器及固封式真空开关。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，该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。

KYN28A—24 armored removable AC metal—enclosed switchgear(hereinafter referred to as switchgear), suitable for indoor three—phase 50/60Hz, 24kV rated voltage power system, mainly used in power plants, substations, industrial and mining operations.In enterprises and high—rise buildings, as a means of receiving and distributing electrical energy and controlling, protecting and monitoring circuits.

The KYN28A—24 switchgear has various functions to prevent misoperation, including preventing the handcart from moving with load, preventing the grounding switch from closing the circuit breaker, preventing the grounding switch from being energized, and preventing accidental entry into the live compartment. The switchgear is equipped with VS1, VN2 series medium-mounted high—voltage AC vacuum circuit breakers and solid—sealed vacuum switches with excellent performance. The secondary circuit of the switchgear is equipped with advanced and reliable control and protection components; the busbar adopts heat—shrinkable insulation material or epoxy-coated insulation means to optimize the shape of the electrode, and the cabinet structure is compact. The switchgear is advanced in technology, stable in performance and reasonable in structure. it is an easy to use,safe and reliable power distribution equipment.

KYN28A-24 型铠装移开式交流金属封闭开关设备

Type armored removable AC metal-enclosed switchgear

型号含义 / Model meaning

K Y N 28A - 24 Z

- 真空断路器Vacuumcircuitbreaker
- 额定电压Ratedvoltage（kV）
- 设计序号DesignNumber
- 户内 Indoor
- 移开式Removetype
- 金属铠装式Metalarmored

使用条件/Conditions of Use

海拔高度不超过1000m；

环境温度：-15℃~+40℃，且在24h内测得的平均值不超过35℃；

相对湿度：日平均值不大于95%；月平均值不大于90%；日水蒸气压力平均值不大于2.2kPa；月水蒸气压力平均值不大于1.8kPa；

周围空气没有明显地受到尘埃、烟、腐蚀性或可燃性气体、蒸汽或盐雾的污染；

来自开关设备和控制设备外部的振动或地动是可以忽略的；

在二次系统中感应的电磁干扰的幅值不超过1.6kV。

Altitude: no more than 1000m;

Ambient temperature: maximum temperature:+40°C,minimum temperature:-15°C,and the average value measured within 24 h does n ot exceed35 ℃；

Relative humidity: the average value of daily relative humidity does not exceed 95%;the average value of monthly relative humidity does not exceed 90%;the average value of daily water vapor pressure does not exceed 2.2 kPa;the average value of monthly water vapor pressure does not exceed 1.8kPa;

The surrounding air is not obviously contaminated by dust, smoke, corrosive or flammable gases, steam or salt spray;

Vibration or ground motion from outside the switchgear and control equipment is negligible;

The amplitude of electromagnetic interference induced in the secondary system does not exceed 1.6kV.

项目Project		单位 Unit	参数Parameter			
额定电压Ratedvoltage		kV	24			
额定频率Ratedfrequency		Hz	50/60			
额定绝缘水平 Rated insulation level	1min工频耐受电压（有效值） Power frequency withstand voltage(RMS)	kV	相间相对地 Relatively	60	隔离断口 Isolation fracture	79
	雷电冲击耐受电压（峰值） Lightning impulse withstand voltage (peak)			125		145
	辅助控制回路工频耐受电压 Auxiliary control loop power frequency withstand voltage	V	2000			
额定电流Ratedcurrent		A	630、1250、1600、2000、2500、3150			
额定短路开断电流Ratedshort-circuitbreakingcurrent		kA	20		31.5	
额定短路关合电流（峰值）Rated short circuit closing current (peak)		kA	50		80	
额定短时耐受电流 Rated short-time withstand current (4s)		kA	20		31.5	
额定峰值耐受电流 Rated peak withstand current		kA	50		80	
辅助控制回路额定电压 Auxiliary control loop rated voltage		V	直流或交流 DC or AC 110/220			
防护等级Protectionlevel			IP4X（断路器室门打开或隔室室间为IP2X） IP4X (breaker door open or IP2X between compartments)			
外形尺寸（宽×深×高）Dimensions（W×DxH）		mm	800 × 1810 × 2380		1000×1810×2380	
重量Weight		Kg	840~1440			

KYN28A-12

Product series



产品概述/Product Overview

KYN28A-12型户内交流铠装移开式金属封闭开关设备。它适用于三相交流额定电压12kV，额定频率50Hz电力系统，用于接受和分配电能并对电路实行控制、保护及监测。

本产品符合GB3906《3-35kV交流金属封闭开关设备》、GB/T11022《高压开关设备和控制设备标准的共用技术要求》、IEC60298《额定电压1kV以上52kV及以下交流金属外壳开关设备和控制设备》、DL/T404《户内交流高压开关柜订货技术条件》标准的要求。

KYN28A-12

It is suitable in a 50Hz 12kV three—phase AC power system, for recieving, distributing, controling, protecting and monitoring electrical circuit energy.

This product complies with GB3906 "3-35kV AC metal-enclosed switchgear", GB/T1 1022 "Common technical requirements for high—voltage switchgear and control equipment standards", IEC60298"AC metal enclosure switchgear and control equipment with rated voltage above 1 kV and 52kV and below", DL/T404"Indoor AC high voltage switchgear booking technical conditions"standard requirements.

KYN28A-12 铠装开移式金属封闭开关设备
Armored open metal sealing switchgear

型号含义/Model meaning

K Y N 28A - 12 / □ □

- 环境特征代号 Environmental feature code
  TH-用于湿热带；TA-用于干热带；G-用于高海拔；C-用于寒带
  TH-for wet tropical; T A—for dry tropical; G-for high altitude; C-for cold zone
- 一次回路方案Primarycircuitscheme
- 额定电压Ratedvoltage（kV）
- 设计序号DesignNumber
- 户内 Indoor
- 移开式（手车中置式）Removal type (handcart center type)
- 金属封闭铠装式Metal-enclosedarmored

使用条件/Conditions of Use

海拔高度不超过1000m；
环境温度：-15℃~+40℃（特殊工艺下，可达-45℃）；
相对湿度：日平均值小于95%，日平均值不大于90%；
地震烈度：地震烈度不超过8级；
环境条件：周围空气应不含腐蚀性或可燃气体、水蒸气等明显污染；
无严重污秽及经常性的剧烈震动，严酷条件下严酷度设计满足1类要求；
在超过GB3906规定的正常环境条件下使用时，由用户和制造厂协商。

• Altitude: no more than 1000m;
Ambient temperature: upper limit +40°C, lower limit-15°C(under special process,up to-45°C);
Relative humidity: daily average <95%.Monthly average≤90%;
Seismic intensity: Anti—seismic;the seismic intensity does not exceed 8;
Environmental conditions: The surrounding air should be free of corrosive or flammable gas,water vapor and other obvious pollution;
No serious pollution and frequent severe vibration.Strict design under severe conditions meets Class 1 requirements;
Useage under conditions specitied in GB3906 is to be negotiated betwe n the user and manufacturer

KYN28A-12

技术参数/Technicalparameters

项目Project		单位 Unit	参数Parameter		
额定电压Ratedvoltage		kV	3.6、7.2、12		
额定频率Ratedfrequency		Hz	50		
断路器额定电流Circuitbreakerratedcurrent		A	630、1250、1600、2000、2500、3150		
开关柜额定电流 Switch cabinet rated current		A	630、1250、1600、2000、2500、3150		
额定动稳定电流Rateddynamiccurrent（4s）		kA	16、20、25、31.5、40、50		
额定稳定电流（峰值）Rated steady current (peak)		kA	40、50、63、80、100、125		
额定短路开断电流Ratedshort-circuitbreakingcurrent		kA	16、20、25、31.5、40、50		
额定短路关合电流（峰值）Rated short circuit closing current (peak)		kA	40、50、63、80、100、125		
额定绝缘水平 Rated insulation level	1min工频耐受电压 Power frequency withstand voltage	kV	24	32	42
	雷冲击耐受电压 Light impulse withstand voltage		40	60	75
防护等级 Protection level		外壳IP4X、隔离间、断路器室门打开时为IP2X IP2Xfor enclosure IP4X, isolation compartment, and circuit breaker compartment door			

KYN28A-12 铠装开移式金属封闭开关设备
Armored open metal sealing switchgear

VD4、VS1-12真空断路器技术参数 / Vacuum circuit breaker technical parameters

项目Project		单位 Unit	参数Parameter
额定电压Ratedvoltage		kV	12
额定频率Ratedfrequency		Hz	50
断路器额定电流Circuitbreakerratedcurrent		A	630、1250、1600、2000、2500、3150
额定动稳定电流 Rated dynamic current (4s)		kA	16、20、25、31.5、40、50
额定稳定电流（峰值）Rated steady current (peak)		kA	40、50、63、80、100、125
额定短路开断电流Ratedshort-circuitbreakingcurrent		kA	16、20、25、31.5、40、50
额定短路关合电流（峰值）Rated short circuit closing current (peak)		kA	40、50、63、80、100、125
额定绝缘水平 Rated insulation level	1min工频耐受电压 Power frequency withstand voltage	kV	42
	雷冲击耐受电压 Light impulse withstand voltage		75
额定操作顺序 Rated operation sequence			分-0.3s-合分-180s-合分50
额定短路开断电流开断次数 Rated short-circuit breaking current breaking times		次	50
机械寿命 Mechanical life		次	20000

VD4、VS1真空断路器机械特性 / Vacuum circuit breaker mechanical characteristics

项目Project		单位 Unit	参数Parameter
触头开距Contactopening distance		mm	11±1
超行程 Overtravel		mm	4±0.5
相间中心距离 Interphase center distance		mm	210±0.5、275±0.5
合闸触头弹跳时间 Closing contact bounce time		ms	≤2
三相分闸不同期性Three-phase opening and closing		ms	≤2
分闸时间当操作电压为 Opening time When the operating voltage is	最高Highest	ms	≤50
	额定Rated		≤50
	最低Lowest		≤60
合闸时间 Closing time		ms	≤100
平均合闸速度Averageclosingspeed		m/s	0.9-1.2
平均分闸速度 Average opening speed		m/s	0.6-0.8

当断路器用于控制3~10kV电动机时，若起动电流小于600A，必须加金属氧化锌避雷器，其具体要求由用户与我公司协商：当断路器用于开断电容器组时，电容器的额定电流不应大于断路器额定电流的80%。

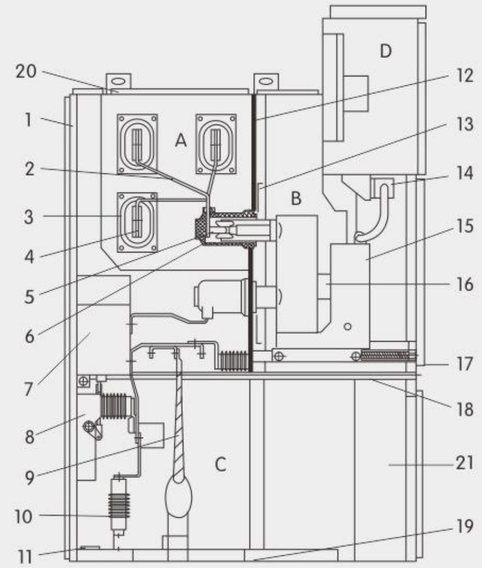
When the circuit breaker is used to control a 3—10kV motor, if the starting current is less than 600A, metal zinc oxide arrester must be added. The specific requirements are to be negotiated by the user and our company: when the circuit breaker is used to break the capacitor bank, the rated current of the capacitor should not be Greater than 80% of the rated current of the circuit breaker.

KYN28A-12 铠装开移式金属封闭开关设备
Armored open metal sealing switchgear

操作机构技术参数/Operatingmechanismtechnicalparameters

项目Project		单位Unit	参数Parameter
额定操作电压 Rated operating voltage	合闸线圈Closingcoil	V	AC/DC220,110
	分闸线圈Openingcoil	V	AC/DC220,110
额定操作电压 Rated operating voltage	合闸线圈Closingcoil	A	245
	分闸线圈Opening coil	W	245
储能电机功率Energystoragemotorpower		W	50
储能电机额定电压 Rated voltage of energy storage motor		V	AC/DC220,110
储能时间Energystoragetime		s	≤10

开关设备结构示意图/Schematicdiagramofswitchgear



开关设备结构示意图
Schematic diagram of switchgear structure

A.母线室 B.断路器手车室 C.电缆室 D.继电器仪表室
A. Bus room B. circuit breaker handcart room
C. cable room D. relay instrument room

1.外壳	1. Shell
2.分支母线	2. Branch bus
3.母线套管	3. Bus bushing
4.主母线	4. Main bus
5.静触头装置	5. Static contact device
6.触头盒	6. Contact box
7.电流互感器	7. Current transformer
8.接地开关	8. Earthing switch
9.电缆	9. Cable
10.避雷器	10. Lightning arrester
11.接地母线	11. Ground bus
12.装卸式隔板	12. Removable partition
13.隔板（活门）	13. Diaphragm (valve)
14.二次插头	14. Secondary plug
15.断路器手车	15. Circuit breaker handcart
16.加热装置	16. Heating device
17.可抽出式水平隔板	17. Extractable horizontal diaphragm
18.接地开关操作机构	18. Operating mechanism of grounding switch
19.底板	19. Base plate
20.泄压装置	20. Pressure relief device
21.控制导线槽	21. Control wiring duct

MKXt6

Fully insulated compact gas ring network cabinet



产品概述/Product Overview

随着现代化城乡电网迅猛发展，需要大量的二次变电站将电力分配至用户终端。配电设备的安全与可靠性，质检影响配电网络的稳定性。根据市场需求，我公司研发出MKXt6系列全绝缘紧凑型气体环网柜。我公司技术研发团队有着丰富的SF6气体绝缘的中压开关柜研发经验，借助计算机模拟仿真技术，并借鉴ABB、西门子国网先进技术，开发出一款结构简单、可靠度高的气体绝缘开关设备—MKXt6系列产品。其灵活的扩展性与固定式完美结组合，能够满足配电场地小，可靠性要求高及地下室、高原、沿海等地区等自然环境和相对恶劣的环境场合。

配合一二次融合套件后可实现一二次/融合功能。本产品并获得国家专利：专利号：201710829544.2专利名称：灭弧的高压开关柜

MKXt6

With the rapid development of modern urban and rural power grids,a large number of secondary substations are needed to distribute power to user terminals.Safety and reliability of power distribution equipment, quality inspection affects the stability of the power distribution network. According to the market demand, our company has developed the MKxt6 series, a fully insulated and compact gas ring network cabinet. Our company's technology research and development team has rich experience in R&D of SF6 gas-insulated medium voltage switchgear. With the help of computer simulation technology and drawing on the advanced technology of ABB and Siemens State Grid, we have developed a gas insulated switchgear with simple structure and high reliability. —MKXt6 series products. Its flexible expansion and fixed-type perfect combination can meet the small distribution area, high reliability requirements and natural environment and relatively harsh environment in basement, plateau, coastal and other areas.

A quadratic/fusion function can be achieved with a second fusion kit. This product has obtained the national patent: Patent No.: 201710829544.2 Patent Name: High—voltage switchgear with arc extinguishing

MKXt6 全绝缘紧凑型气体环网柜
Fully insulated compact gas ring network cabinet

型号含义 / Model meaning

MK X t 6 - □ - □ - □ - □

- C:负荷开关模块C:loadswitchmodule
  - De：带接地刀的电缆连接模块 De:cable connection module with grounding knife
  - D：不带地刀的电缆连接模块 D:Cable connection module without ground knife
  - F：负荷开关-熔断器组合电器模块 F:load switch-fuse combination electric module
  - V:真空断路器模块V:vacuumcircuitbreakermodule
  - SL：母线分段负荷开关模块SL：Busbarsectionloadswitchmodule
  - SV：母线分段真空断路器模块 SV:Busbar Sectional Vacuum Circuit Breaker Module
  - M：计量功能模块 M:metering function module
  - P：不带隔离开关电压互感器柜 P:without isolation switch voltage transformer cabinet
  - PD：带隔离开关电压互感器柜PD:Voltagetransformercabinetwithisolationswitch
- 额定电压Ratedvoltage：12kV，24kV
- S:母线侧面扩展、T：母线顶部扩展S:bussideextension，T:bustopextension
- B：不可扩展、E：可扩展 B:not expandable，E:expandable
- 六氟化硫气体 Sulfur hexafluoride gas
- 特殊气体Specialgas
- 箱式 Box type
- 明控电气 Mingkong Electric

产品特点/ProducrFeatures

MKXt6-12/24全绝缘充气柜SF6气体作为灭弧及绝缘介质。

开关柜为全密封、全绝缘结构；母线、开关及带电部件完全封闭在不锈钢壳体中。腔体充以（0.03~0.04MPa）的SF6气体，防护等级达到，IP67；整个开关装置完全不受外部环境条件的影响，即使在短时水浸等极端情况下也能保证开关正常运行，产品终身免维护。

开关柜具有完善的“五防”联锁装置，彻底杜绝人为误操作可能引起的人员及设备运行故障。

·所有开关柜具有可靠的安全泄压通道，即使在极端情况下也能保障操作人员人身安全。

开关柜分为固定单元组合和可扩展单元组合两类。

·开关柜通常由正面进出线，也可按不同的安装位置实现侧出线或侧扩展。

开关柜可根据用户的不同需求配置电动、远控及监测装置。

本环网柜为单间隔柜体方式，环网箱为各种单间隔的组合方式。

MKXt6

MKXt6-12/24 fully insulated inflatable cabinet SF6 gas is used as arc extinguishing and insulating medium.

The switchgear is fully sealed and fully insulated; the busbars, switches and live parts are completely enclosed in a stainless steel housing.

S F6 gas(0.03-0.04MPa), up to the IP67 protection level. The whole switchgear is completely unaffected by external environmental conditions, and the switch can be operated normally even under extreme conditions such as short—time flooding. The product is maintenance—free for life.

The switchgear has a complete "five—proof"interlocking device to completely eliminate the malfunction of personnel and equipment that may be caused by human error.

All switchgear cabinets have a reliable and safe pressure relief channel, which guarantees the operator's personal safety even under extreme conditions.

The switchgear is divided into two types: fixed unit combination and expandable unit combination.

Switchgear cabinets usually have front and rear access lines, or side outlets or side extensions can be implemented at different installation positions.

The switchgear can be equipped with electric, remote control and monitoring devices according to different needs of users.

The ring network cabinet is a single—slot cabinet. The ring cage is a combination of various single-intervals.

MKXt6 全绝缘紧凑型气体环网柜
Fully insulated compact gas ring network cabinet

正常运行环境条件 / Normal operating environment conditions

项目Project	参数Parameter
最高温度Maximumtemperature	+40℃
最低温度Lowesttemperature	-40°C
湿度Humidity	0
24小时测量 24-hour measurement	≤ 95°
1个月测量 1month measurement	≤90°
海拔高度Altitude	≤2000米（标准充气压力下）≤2000 meters (under standard inflation pressure)
SF6气体压力SF6gaspressure	20℃下为1.45bar（绝对压力）24kV 1.45bar (absolute pressure) 24kV at20℃
防护等级 Protection level	IP67
SF6气室SF6gaschamber	IP67
熔断路筒Fusedroadtube	IP67
外壳Shell	IP4X
气室不锈钢厚度Gaschamberstainlesssteelthickness	3.0mm
年泄漏率 Annual leakage rate	0.25%/年

注：对于有别于正常运行条件下的特殊运行条件，在订货时需要用户与制造商协商处理。如果涉及特殊恶劣的环境，如高海拔、低温、严重污秽的场所，必须制造商或供应商联系。

Note:For special operating conditions that are diferent from normal operating conditions, the user needs to the manufacturer when ordering.If you are involved in a particularly harsh environment, such as high altitude, low temperatures, and severely contaminated locations, you must contact the manufacturer or supplier.

符合标准 / Standards compliant

GB1984-2014《高压交流断路器》
GB1985-2014《高压交流隔离开关和接地开关》
GB3309-1989《高压开关设备在常温下的机械试验》
GB3804-2004《3.6KV~40.5高压交流负荷开关》
GB3906-2006《3.6kV-40.5kV交流金属封闭开关设备和控制设备》
GB/T8905-1996《六氟化硫电气设备中气体管理和检验导则》
GB/T11022-1999《高压开关设备和控制设备标准的共用技术要求》
GB/T11023-1989《高压开关设备六氟化硫气体密封试验方法》
GB16926-2009《交流高压负荷开关-熔断路组合电器》

GB1984-2014"High Voltage AC Circuit Breaker"
GB1985-2014"High Voltage AC Isolation Switch and Grounding Switch"
GB3309—1989"Mechanical test of high voltage switchgear at room temperature"
GB3804—2004"3.6kV—40.5 high voltage AC load switch"
GB3906-2006"3.6kV ~ 40.5kV AC metal-enclosed switchgear and control equipment"
GB/T8905-1996"Guidelines for Gas Management and Inspection in Electrical Equipment for Sulfur Hexafluoride"
GB/T11022-1999"Common technical requirements for high-voltage switchgear and control equipment standards"
GB/T11023-1989"High-voltage switchgear sulphur hexafluoride gas seal test method"
GB16926-2009"AC high voltage load switch-fuse circuit combination"

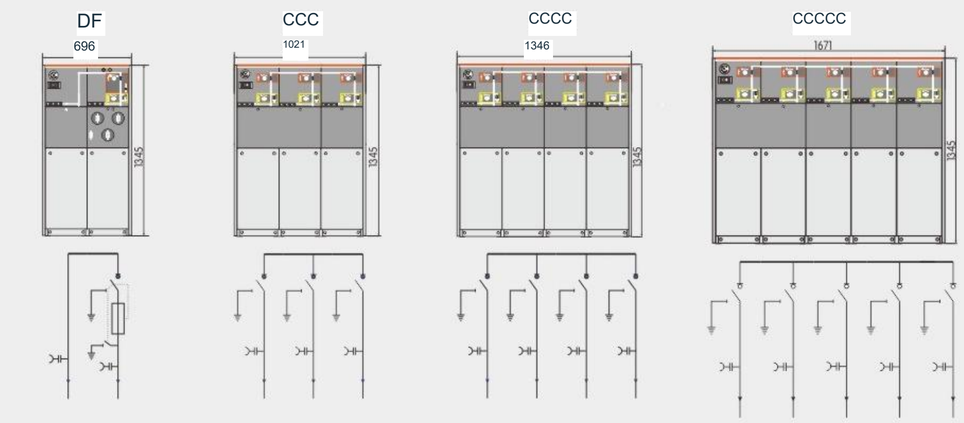
MKXt6 全绝缘紧凑型气体环网柜
Fully insulated compact gas ring network cabinet

操作机构技术参数/Operatingmechanismtechnicalparameters

项目Project	C柜Cabinet		C柜Cabinet		C柜Cabinet	
额定电压 Rated voltage (kV)	12	24	12	24	12	24
额定频率Ratedfrequency（Hz）	50	50	50	50	50	50
额定电流Rated current（A）	630	630	注1	注1	630/1250	630
工频耐受电压 Power frequency withstand voltage (kV)	42/48	65/79	42/48	65/79	42/48	65/79
雷电冲击耐受电压Lightningimpulsewithstandvoltage（kV）	75/85	125/145	75/85	125/145	75/85	125/145
二次回路工频耐压 Secondary circuit power frequency withstand voltage (V)	2000	2000	2000	2000	2000	2000
额定负荷开断电流Ratedloadbreakingcurrent（A）	630	630	630	630	–	–
额定短路开断电流Ratedshort-circuitbreakingcurrent（kA）	–	–	31.5	31.5	25	25
短时耐受电流（峰值）Short-time withstand current(peak)(kA)	25(50)	25(50)	–	–	25(50)	25(50)
短路关合电流Shortcircuitclosingcurrent（kA）	50	50	–	–	50	50
额定转移电流 Rated transfer current (A)	–	–	1750	1400	–	–
机械寿命（次）Mechanical life (times)	5000	5000	5000	5000	10000	10000
防护等级（外壳/气箱）Protection level (housing/air box)	IP4X/IP67		IP4X/IP67		IP4X/IP67	
内部燃弧试验 Internal arc test (kA)	25(1s)		25(1s)		25(1s)	
局部放电 Partial discharge (pc)	≤20	≤20	≤20	≤20	≤20	≤ 20

注1：取决于熔断器的电流额定值
Note 1: Depending on the current rating of the fuse

组合方案/Combinationscheme



标准2路DF（260kg）标准3路CCC（300kg）　标准4路CCCC（390kg）　标准5路CCCCC（480kg）

MKX375~550

Compact metal-enclosed switchgear



产品概述/Product Overview

MKX375~550-12是目前中置移开式开关设备体积最小、绝缘性能最高的开关设备，海拔高度达到3000米，全部采用APG固体绝缘、硅橡胶密封技术，为国际首创。

我公司自主研发的MKX375~550型小型化金属封闭移开式开关设备（以下简称开关设备），适用于3~10kV三相交流50Hz单母线及母线分段的成套装置。

主要用于发电厂中小型发电机送电、工矿企业配电以及电力系统的二次变电所的变电送电及大型高压电动机起动等，实行控制、保护、监测之用。

MKX375-550-12 is the switchgear with the smallest volume and highest insulation performance of the centrally-disconnected switchgear.The altitude is up to 3000 meters. All of them adopt APG solid insulation and silicone rubber sealing technology, which is the first in the world.

Our company's independently developed MKX375~550 miniaturized metal-enclosed switch-type switchgear(hereinafter referred to as switchgear), which is suitable for 3-10kV three-phase AC 50Hz single busbar and busbar segmented complete sets.

It is mainly used for power transmission of small and medium—sized generators in power plants, power distribution of industrial and mining enterprises, and substation power transmission and large—scale high—voltage motor starting of power systems. It is used for control, protection and monitoring.

MKX375~550-12 小型化金属封闭移开式开关设备

Miniaturized metal-enclosed removable switchgear

型号含义 / Model meaning

MKX 375~550 - 12 (Z) / T 2000 - 31.5

- 额定开断电流Ratedbreakingcurrent（KA）
- 额定电流Ratedcurrent（A）
- 弹簧机构Springmechanism
- 真空型Vacuumtype
- 额定电压Ratedvoltage（kV）
- 柜体宽度Cabinetwidth（375、400、450、550）
- 户内用高小型化开关设备（最小的柜体最大的电流容量）
  High— density switchgear for indoor use (minimum cabinet current capacity)

使用条件/Conditions of Use

海拔高度不超过3000m；

环境温度：-45℃~+45℃；

相对湿度：日平均值不大于95%，日平均值不大于90%；

地震烈度：地震烈度不超过8级；

环境条件：周围空气应不含腐蚀性或可燃气体、水蒸气等明显污染；

无严重污秽及经常性的剧烈震动，严酷条件下严酷度设计满足1类要求；

在超过GB3906规定的正常环境条件下使用时，由用户和制造厂协商。

Altitude: no more than 3000m;

Ambient temperature: upper limit +45°C, lower limit-45°C;

Relative humidity: daily average ≤95%.Monthly average≤90%;

Seismic intensity: Anti—seismic;the seismic intensity does not exceed 8;

Environmental conditions: The surrounding air should be free of corrosive or flammable gas,water vapor and other obvious pollution;

No serious pollution and frequent severe vibration.Strict design under severe conditions meets Class 1 requirements;

When using in the normal environmental conditions specified in GB3906, the user and the manufacturer negotiate.

技术参数/Technicalparameters

项目Project		单位 Unit	参数Parameter
额定电压Ratedvoltage		kV	3、6、10
最高工作电压Maximumworkingvoltage		kV	3.6、7.2、12
额定频率Ratedfrequency		Hz	50
主母线额定电流Mainbusbarratedcurrent		A	630、1250、1600、2000
分支母线额定电流Branchbusbarratedcurrent		A	630、1250、1600、2000
4S热稳定电流（有效值）4Sthermalstablecurrent（effectivevalue）		kA	16、20、25、31.5
额定绝缘水平 Rated insulation level	1min工频耐受电压 Power frequency withstand voltage	kV	42
	雷冲击耐受电压 Light impulse withstand voltage		75
额定动稳定电流（峰值）Rated dynamic current (peak)		kA	40、50、63、80

MKX375~550-12 小型化金属封闭移开式开关设备

Miniaturized metal-enclosed removable switchgear

应用范围/Applicationrange

商业、服务业：商场、购物中心、办公大楼、医院、游乐场、居民住宅区、基础及民用设施

工矿企业：石油化工、造纸厂、水泥厂、纺织

公用事业及电站：发电厂、变电站、开闭所、环网供电所、主辅助开关站

运输：机场、港口、铁路、地铁

Business, service industry:shopping malls, shopping centers, office buildings, hospitals, playgrounds, residential areas, basic and civil facilities

Industrial and mining enterprises:petrochemical, paper mil, cement plant, textile

Utilities and power stations:power plants, substations, switching houses, ring network power stations, main auxiliary switch stations

Transportation:airport, port, railway, subway

防护等级/Protectionlevel

外壳防护等级为：IP4X

全密封型母线室、电缆室内部主回路防护等级为：IP67

半绝缘型母线室、电缆室内部主回路防护等级为：IP2X

断路器室门打开时为：IP2X

The enclosure protection rating is:IP4X

The main circuit protection level of the fully sealed busbar room and the cable interior is:IP67

The semi-insulated busbar room and the main circuit inside the cable are protected by IP2X.

When the circuit breaker door is open:IP2X

使用标准/Usestandard

GB1984-2003《高压交流断路器》

GB1985-2004《高压交流隔离开关和接地开关》

GB3804-20043.6-40.5kV《高压交流负荷开关》

GB3906-20063.6-40.5kV《交流金属封闭开关设备和控制设备》

GB16926-2009《交流负荷开关—熔断器组合电器》

GB16927.1-1996《高电压试验技术第一部分：一般试验要求》

DLUT402-2007《高压交流断路器订货技术条件》

GB/T11022-2011《高压开关设备和控制设备标准的共用技术要求》

GB/T14597-1993《电工产品不同海拔的气候环境技术条件》

GB311.1-1997《高压输配电设备的绝缘配合》

GB1984-2003"High Voltage AC Circuit Breaker"

GB1985—2004"High Voltage AC Isolation Switch and Grounding Switch"

GB3804-20043.6-40.5kV"High Voltage AC Load Switch"

GB3906—2006 3.6—40.5KV"AC metal—enclosed switchgear and control equipment"

GB16926-2009"AC load switch-fuse combination electric appliance"

GB16927.1-1996"High Voltage Test Technology Part 1: General Test Requirements"

DL/T402-2007"Technical Conditions for Ordering High Voltage AC Circuit Breakers"

GB/T11022-2011"Common technical requirements for high-voltage switchgear and control equipment standards"

GB/T14597-1993"Technical conditions for climatic environment at different altitudes of electrical products"

GB311.1 —1997 "Insulation coordination of high voltage transmission and distribution equipment"

MKX375~550-12 小型化金属封闭移开式开关设备

Miniaturized metal-enclosed removable switchgear

结构示意图/Structurediagram

开关柜按GB3906中的铠装式金属封闭开关设备而设计。整体是由柜体和中置式可抽出部件（即手车）两大部分组成。柜体分为四个单独的隔室，外壳防护等级为IP4X，各小室间和断路器室门打开时防护等级为IP2X。具有架空进出线、电缆进出线及其它功能方案，经排列、组合后能成为各种方案形式的配电装置。本开关柜可以从正面进行安装调试和维护，因此它可以背靠背组成双重排列和靠背安装，提高了开关柜的安全性、灵活性，减少了占地面积。

外壳：开关柜外壳零件均采用2mm厚敷铝锌钢板，经CNC机床加工，并采用多重折边工艺。这样使整个柜体不仅具有精度高、很强的抗腐蚀与抗氧化作用，而且由于采用多重折边工艺，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，用拉柳螺母和高强度的螺栓联接而成。这样使生产周期短、零部件通用性强，便于组织生产。

The switchgear is designed according to the armored metal—enclosed switchgear in GB3906.The product is composed of two parts:the cabinet and the centrally—mounted extractable parts (ie the handcart) . The cabinet is divided into four separate compartments with IP4X enclosure rating and IP2X protection for each compartment and breaker compartment door.It has overhead access lines, cable entry and exit lines andother functional solutions.After being arranged and combined, it can be a power distribution device of various schemes. The switchgear can be installed, commissioned and maintained from the front, so it can be back—to—back and double—arranged and mounted, which improves the safety, flexibility and floor space of the switchgear.

Shell: The parts of the switchgear cabinet are made of 2mm thick aluminum-zinc steel plate, processed by CNC machine tool and adopt multi—folding process.In this way, the whole cabinet not only has high precision and strong anti—corrosion and anti—oxidation effects, but also adopts multiple hemming process, so that the cabinet body is lighter in weight, higher in mechanical strength and beautiful in appearance than other similar equipment cabinets. The cabinet body adopts an assembled structure and is connected by a rivet nut and a high—strength bolt. This makes the production cycle short, the parts are versatile, and it is easy to organize production.

MKX65-12

Solid insulated switchgear



产品概述/Product Overview

MKX65-12（CVF）固体绝缘环网柜开关设备是本公司自行研发的新　–代环保型固体绝缘环网柜。主要由三种功能单元组成，即V单元（断路器单元），C单元（负荷开关），F单元（组合电器单元）　，每个单元可以单独使用也可以自由扩展，其结构分为智能控制仪表室、操作机构和一次部分，仪表室可配微机保护（控制器），机构为专用弹操机构，一次部分采用APG自动凝胶工艺，将隔离开关和灭弧室完全封在环氧树脂中，并有专用接头和母线相连。灭弧室的设计开关选用灭弧室采用专用的铜铬触头材料，R型纵磁场触头，以及完全一次封排工艺，该灭弧室开断短路电流能力、稳定性、电寿命、温升以及绝缘水平都较之前的灭弧室（铜铝触头材料，杯状纵磁场触头结构，以及不完全一次封排工艺）有了明显提高。操动机构采用与开关配合一体的弹操机构，即隔离开关和主开关弹操机构为一整体，可方便实现互锁，而且机构零件少，减少了不必要的传动环节，可靠性高，并可根据用户需要加装电动操作。

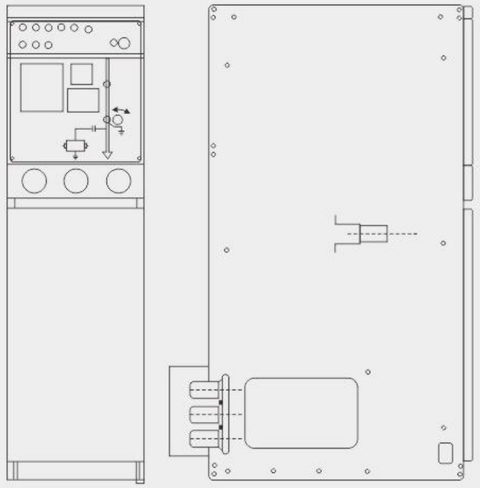
固定绝缘全封闭开关设备：是采用固体绝缘材料为主绝缘介质及导电连接、隔离开关、接地开关、主母线、分支母线等主导电回路单一或组合后用固体绝缘介质包覆封装为一个或几个具有一定功能、可再次组合或扩展的具备全绝缘、全密封性能的模块。

三工位机构采用过中弹簧设计，具有开关和关合负荷电流的作用，并且还可以实现手动和电动操作。

MKX65-12 (CVF) solid insulated ring network cabinet switchgear is a new generation of environmentally friendly solid insulated ring network cabinet developed by the company. It is mainly composed of three functional units, namely V unit (breaker unit), C unit (load switch), F unit (combined electric unit), each unit can be used alone or freely, and its structure is divided into intelligent control instruments. The chamber,the operating mechanism and the primary part, the instrument room can be equipped with a microcomputer protection (controller), the mechanism is a special elastic operation mechanism, and the APG automatic gel process is used in one part, and the isolation switch and he arc extinguishing chamber are completely sealed in the epoxy resin. There are special connectors and busbars connected. The desigrswitch of the arc extinguishing chamber uses the special

MKX65-12(CVF) 固体绝缘环网柜
Solid insulated ring network cabinet

copper-chromium contact material, the R—type vertical magnetic field contact and the complete primary sealing process. The arc—breaking chamber breaks the short—circuit current capability, stability, electrical lif and temperature. The rise and insulation levels are significantly improved compared to the previous arc-extinguishing chamber (copperaluminum contact material, cup—shaped longitudinal magnetic field contact structure, and incomplete primary sealing process). The operating mechanism adopts a sliding mechanism integrated with the switch, that is, the isolating switch and the main switch playing mechanism are integrated, which can easily realize interlocking, and has fewer mechanism parts, reduces unnecessary transmission links, and has high reliability, and Electric operation can be added according to user needs.



除面板集成的模拟分合位置显示外，通过柜体前方的可视观察窗可直观的观察到内部隔离刀的合、分及接地触头的状态。
In addition to the integrated analog position display of the panel, the view of the inner isolation knife and the ground contact can be visually observed through the visual observation window in front of the cabinet.

型号含义 / Model meaning

MK X 65 - 12 / □ □

- 额定开断短路电流Ratedbreakingshortcircuitcurrent（KA）
- 额定电流Ratedcurrent（A）
- 额定电压Ratedvoltage（kV）
- 设计代号Designcode
- 箱式Boxtype
- 明控电气 Mingkong Electric

按在系统中的功能单元分类为：进线柜、出线柜、母联柜、计量柜、PT柜、提升柜等，用接线方案号表示；按主开关元器件类型分为：负荷开关柜，负荷开关-熔断器组合电器柜、断路器柜及隔离开关柜等，分别用F（熔丝组合电器）、V（断路器）、C（负荷开关）等表示。

According to the functional units in the system, they are classified into: the incoming cabinet, the outlet cabinet, the female cabinet, the metering cabinet, the PT cabinet, the lifting cabinet, etc., which are represented by the wiring scheme number; According to the main switch component type: load switch cabinet, load switch—fuse combination electrical cabinet, circuit breaker cabinet and isolation switch cabinet, etc, respectively,F(fuse combination),V(circuit breaker),C(load Switch) and so on.

MKX65-12(CVF) 固体绝缘环网柜
Solid insulated ring network cabinet

使用条件/Conditions of Use

海拔高度不超过5000m；
环境温度：-45℃~+65℃：日平均值不大于+45℃
相对湿度：日平均值不大于95%，月平均值不大于90%；
不受腐蚀性或可燃性气体等明显污染的环境；
无火灾、爆炸危险，无经常性的剧烈振动的场合；
注：当使用环境条件不同或有其它特殊要求时，可与制造厂协商提供特殊使用条件下的产品：

The altitude does not exceed 5000m ；
Ambient temperature:-45°C~+65°C;daily average is not greater than+45°C;
Relative humidity:the daily average is not more than 95%,and the monthly average is not more than 90%;
An environment that is not subject to obvious pollution such as corrosive or flammable gases;
No fire,explosion hazard,no frequent and severe vibration;
Note:When the use of different environmental conditions or other special requirements,the manufacturer can be negotiated to provide products under special conditions of use;

技术参数/Technicalparameters

项目Project	V单元Unit		C 单元 Unit	F单元Unit
额定电压Ratedvoltage(kV)	12		12	12
额定电流Rated current（A）	630	1250	630	125

额定频率Ratedfrequency（Hz）	50			
工频耐受电压（kV）相间、相对地/断口 Power frequency withstand voltage (kV) phase , relative ground/fracture	42/48			
雷电冲击耐受电压（kV）相间、相对地/断口 Lightning impulse withstand voltage (kV) phase , relative/fracture	75/85			
额定短路开断电流 Rated short-circuit breaking current (kA)	25	31.5		31.5（熔断器Fuse）
额定电缆充电开断电流Ratedcablechargingbreaking current（A）	25	31.5	10	
额定短时耐受电流Ratedshort-timewithstandcurrent（kA）	25	31.5	20	
额定短时耐受时间Ratedshort-timewithstandtime（S）	4	4	4	
额定峰值耐受电流 Rated peak withstand current (kA)	63	80	50	
额定短时关合电流Ratedshort-timeclosingcurrent（kA）	63	80	50	
额定转移电流 Rated transfer current (A)				3150
额定交接电流Ratedjunctioncurrent（A）				3700
局部放电Partialdischarge（PC）	≤20			
防护等级柜体/开关 Protection level Cabinet/switch	IP4X/IP67			
主回路电阻 Main loop resistance（μΩ）	≤150	≤150		≤700
机械寿命（次）主开关/隔离开关 Mechanical life (times) main switch/isolating switch	10000/3000	10000/3000		5000/3000

XGN2-12

Product series



产品概述/Product Overview

XGN2-12箱型固定式金属封闭开关设备（简称“开关设备”），适用于额定电压为3.6~12kV、50Hz，额定电流630A-3150A三相交流单母线、双母线、单母线带旁路系统，作为接受和分配电能之用。可满足各种类型发电厂、变电站（所）及工矿企业使用要求。
本产品符合国家标准GB3906《3-35kV交流金属封闭开关设备》、IEC60298《交流金属封闭开关设备和控制设备》、及DL/T402、DL/T404标准，达到“五防”闭锁要求。

XGN2—12 box type fixed metal enclosed switch device(referred to as "switching device"), suitable for rated voltage 3.6~12kV,50Hz, rated current
630A—3150A three—phase AC single bus, double busbar, single busbar bypass system, as a means of receiving and distributing electrical energy. It can meet the requirements of various types of power plants, substations (houses) and industrial and mining enterprises.
This product complies with the national standard GB3906"3—35kV AC metal—enclosed switchgear", IEC60298 "AC metal-enclosed switchgear and control equipment", and DL/T402, DL/T404 standards, to achieve the "five-proof"blocking requirements.

XGN2-12 箱型固定式金属封闭开关设备
Box type fixed metal enclosed switchgear

型号含义 / Model meaning

X G N 2 - 12 Z

- 真空断路器Vacuumcircuitbreaker
- 额定电压Ratedvoltage（kV）
- 设计序号DesignNumber
- 户内 Indoor
- 固定式Fixed
- 箱式Boxtype

使用条件/Conditions of Use

海拔高度不超过1000m；
环境温度：-15℃~+40℃；
相对湿度：日平均值不大于95%，水蒸气压力日平均值不超2.2KPA；月平均值不大于90%，水蒸气压力月平均值不超1.8KPA；
地震强度：不超过8级；
没有腐蚀性或可燃性气体等明显污染的场所。

The altitude does not exceed 1000m;
Ambient temperature:-15°C~+40°C;
Humidity: the daily average value is not more than 95%, the daily average value of water vapor pressure does not exceed 2.2KPA; the monthly average value is not more than 90%, and the monthly average value of water vapor pressure does not exceed 1.8KPA;
Earthquake intensity:no more than 8 levels;
There is no obvious pollution such as corrosive or flammable gas.

负荷开关技术参数/Loadswitchtechnicalparameters

项目Project			单位Unit	参数Parameter
额定电压Ratedvoltage			kV	3.6、7.2、12
额定电流Ratedcurrent			A	630~3150
额定短路开断电流Ratedshort-circuitbreakingcurrent			kA	20、25、31.5、40
额定短路关合电流（峰值）Rated short circuit closing current (peak)			kA	50、63、80、100
额定耐受电流（峰值）Rated withstand current (peak)			kA	50、63、80、100
额定短时耐受电流Ratedshort-timewithstandcurrent			kA	20、25、31.5、40
额定绝缘水平 Rated insulation level	1min工频耐受电压 Power frequency withstand voltage	极间、极对地间 Interpolar and polar	kV	24、32、42
		断口间 Fracture room	kV	24、32、48
	雷电冲击耐受电压 Lightning impulse withstand voltage	极间、极对地间 Interpolar and polar	kV	40、60、75
		断口间Fractureroom	kV	46、70、85
防护等级Protectionlevel				IP2X
主接线型式Mainwiringtype				单母线分段及单母线带旁路 Single busbar segmentation and single busbar bypass
操作机构方式Operatingmechanism				电磁，弹簧储能 Electromagnetic，spring energy storage
外线尺寸（宽×深×高）Outside line size (W×D×H)			mm	1100×1200×2650（一般型 General type）
重量Weight			kg	700

HXGN15-12

Product series



产品概述/Product Overview

HXGN15-12型单元式交流金属封闭环网开关设备（以下简称环网柜）是我们在引进国外先进技术并按照国内农电及城网改造之要求而自行设计、研发成功的新一代高压电器产品。各项技术性能指标全IEC62271-200：2003和GB3906标准。

环网柜的主开关、操作机构及元器件采用ABB公司原装件或采用进口部件国内组装生产的SFL-12/24型开关设备，也可根据用户需要配装ABB公司原装HAD/US型SF6。断路器或VD4-S型真空断路器。其操作方式分为手动、电动两种。

柜体经数控机床加工后铆接而成，防护等级达到P3X，并有可靠的机械联锁和防误操作功能。本产品具有体积小、重量轻、外型美观、操作简便、长寿命、高参数、无污染、少维护等极具显著的特点。

HXGN15-12型单元式交流金属封闭环网开关设备，适用50Hz、12kV的电力网络中，作为电能的接受和分配之用。柜内主开关为SF6开关。

HXGN 15—12 unit type AC metal—enclosed ring network switchgear(hereinafter referred to as ring network cabinet) is a new generation of high—voltage electrical products designed and developed by us in the introduction of foreign advanced technology and in accordance with the requirements of domestic agricultural power and urban network transformation. The technical performance indicators are all IEC62271-200:2003 and GB3906 standards.

The main switch, operating mechanism and components of the ring network cabinet adopt the original ABB original parts or the SFL—12/24 typeswitchgear which is assembled and produced domestically with imported components. It can also be equipped with ABB original HAD/US type SF6 according to user needs. Circuit breaker or VD4—S vacuum circuit breaker. Its operation mode is divided into manual and electric.

The cabinet is riveted by CNC machine tool, the protection level is IP3X, and it has reliable mechanical interlock and anti—misoperation function. This product has the characteristics of small size, light weight, beautiful appearance, easy operation, long life, high parameters, no pollution, and less maintenance.

HXGN15—12 unit type AC metal—enclosed ring network switchgear, suitable for 50Hz,12kV power network, as the acceptance and distribution of electric energy. The main switch in the cabinet is the SF6 switch.

HXGN15-12 单元式交流金属封闭环网开关设备
Unit type AC metal-enclosed ring network switchgear

型号含义 / Model meaning

HX G N 15 - 12 SF6

- SF6：柜内主开关为SF6开关 ThemainswitchinthecabinetisSF6switch
- 12：额定电压Ratedvoltage（kV）
- 15：设计序号DesignNumber
- N：户内 Indoor
- G：固定式Fixed
- HX：箱式环网柜 Box type ring network cabinet

使用条件/Conditions of Use

海拔高度不超过2000m；

环境温度：-25℃~+40℃；

相对湿度：日平均值不大于95%，月平均值不大于90%；

周围环境：周围空气不受腐蚀气体或可燃性气体、水蒸气等明显污染；

没有腐蚀性或可燃性气体等明显污染的场所。

• The altitude does not exceed 2000m;

Ambient temperature:-25°C~+40°C;

Relative humidity:the daily average is not more than 95%;the monthly average is not more than 90%;

Ambient environment: The surrounding air is not obviously polluted by corrosive gases or flammable gases, water vapor, etc.

No frequent and severe vibrations.

主要技术参数/Themaintechnicalparameters

项目Project	单位 Unit	参数 Parameter
额定电压Ratedvoltage	kV	12
额定电流Ratedcurrent	Hz	50
主母线额定电流/熔断器最大额定电流 Main bus rated current/fuse maximum rated current	A	630、125
主回路、接地回路额定短时耐受电流 Main circuit, ground loop rated short-time withstand current	kA/S	20、3
主回路、接地回路额定峰值耐受电流 Main circuit, ground loop rated peak withstand current	kA	50
主回路、接地回路额定短路关合电流 Main circuit, ground circuit rated short circuit closing current	kA	50
负荷开关满容量开断数Loadswitchfullcapacitybreakingnumber	次Time	100
熔断器开断电流Fusebreakingcurrent	kA	31.5、40
额定闭环开断电流Ratedclosed-loopbreakingcurrent	A	630
额定转移电流Ratedtransfercurrent	A	1600
机械寿命 Mechanical life	次Time	2000
1min工频耐压（峰值）相对、对地/隔离断口 power frequency withstand voltage(peak)relative, ground/isolation fracture	kV	42、48
雷电冲击耐受电压（峰值）相间、对地隔离断口 Lightning impulse withstand voltage(peak)phase to ground,ground/isolation fracture	kV	75、85
二次回路1min工频耐压 Secondary circuit 1min power frequency withstand voltage	kV	2
防护等级Protectionlevel		IP3X

HXGN15-12 单元式交流金属封闭环网开关设备
Unit type AC metal-enclosed ring network switchgear

操作/Operating

对于配负荷开关的开关设备，用专用操作手柄在开关设备正面操作，操作机构的正面有上、下两操作孔，上部为接地开关操作孔，下部为负荷开关操作孔。操作时，手柄向顺时针方向旋转为开关合闸方向，逆时针方向旋转为开关分闸方向。也可加装电动分、合闸装置，进行遥控操作。（注意；有时负荷开关不带接地开关，接地开关操作孔被当作柜门解锁之用）。

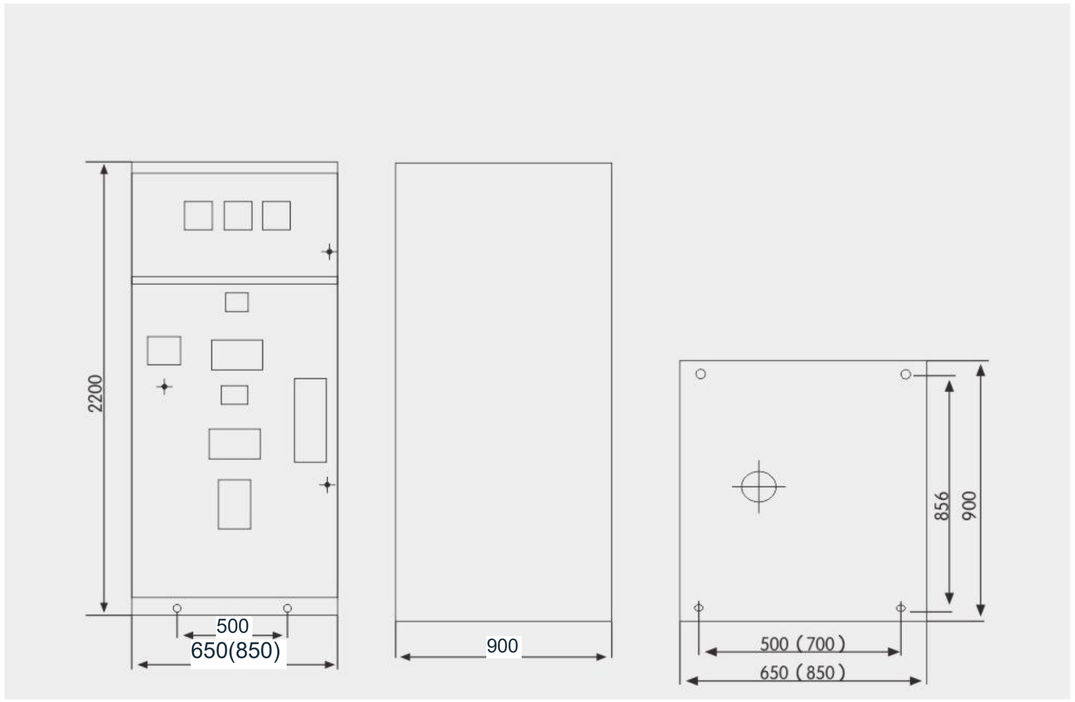
对于配组合电器的开关设备，除负荷开关分闸操作用手动分闸按钮外，其它与上述操作顺序一样。组合电器柜另设的下接地开关，通过连杆与上接地开关同分同合。在合闸时释放下熔断器座上的残余小电流，以提高更换熔断器时的安全性。

HXGN15-12 / XGN66-12

For the switchgear with load switch, the special operation handle is used to operate on the front of the switchgear. The front of the operating mechanism has upper and lower operating holes, the upper part is the grounding switch operating hole, and the lower part is the load switch operating hole. During operation, the handle rotates clockwise to the switch closing direction, and counterclockwise rotation to the switch opening direction. It can also be equipped with electric split and closing devices for remote operation.(Note: Sometimes the load switch does not have a grounding switch, and the grounding switch operating hole is used as the door unlocking).

For the switchgear with the combined electric appliance, except for the manual opening and closing button for the load switch opening operation, the other operation sequence is the same. The lower grounding switch of the combined electrical cabinet is identical to the uppergrounding switch through the connecting rod. The residual small current on the fuse holder is released when the switch is closed to improve the safety when replacing the fuse.

外形及安装尺寸/Shapeandinstallationdimensions（mm）



XGN66-12

Product series



产品概述/Product Overview

XGN66-12（Z）箱型固定交流金属封闭开关设备（以下简称开关柜）是我公司新一代高压电器成套产品，符合国家标准GB3906《-35kV交流金属封闭开关设备》电力部DLT404《户内交流高压开关柜订货技术条件》的要求，也满足国际标准IEC60298《1kV以上52kV以下交流金属封闭开关设备和控制设备的要求》。该产品吸收了国外的先进技术，它体积小，仅是普通开关柜体积的50%，断路器具有可靠性高，性能好；“五防”联锁机构可靠、简单等优点。开关柜是3.6、7.2、12kV三相交流电50Hz单母线分段的户内成套装置，作为接受和分配电能之用。并具有对电路进行控制、保护和监测等功能，可使用在各类型发电厂、变电站及工矿企业，高层建筑等场所，也可与环网柜组合应用于开闭所中。

XGN66-12

XGN66—12(Z) box type fixed AC metal—enclosed switchgear(hereinafter referred to as switchgear) is a new generation of high—voltage electrical complete sets of our company, in line with national standard GB3906 "—35kV AC metal—enclosed switchgear"Power Department DLT404 "Indoor Communication" The requirements for the technical conditions for the ordering of high—voltage switchgear also meet the requirements of the international standard IEC60298 "AC metal—enclosed switchgear and control equipment below 1kV below 52kV". The product absorbs foreign advanced technology, its small size, only 50% of the size of the ordinary switchgear, the circuit breaker has high reliability and good performance; the “five-defence"interlocking mechanism is reliable and simple. The switchgear is a 3.6,7.2,12kV three-phase AC 50Hz single busbar segmented indoor unit for receiving and distributing electrical energy. It has the functions of controling, protecting and monitoring the circuit. It can be used in various types of power plants, substations, industrial and mining enterprises, high—rise buildings, etc, and can also be combined with ring network cabinets for use in opening and closing.

XGN66-12(Z) 箱型固定交流金属封闭开关设备
Box type fixed AC metal-enclosed switchgear

型号含义 / Model meaning

X G N 66 - 12 Z

- Z 真空开关Vacuumswitch
- 12 额定电压Ratedvoltage（kV）
- 66 设计序号DesignNumber
- N 户内 Indoor
- G 固定式Fixed
- X 箱型开关设备 Box type switchgear

使用条件/Conditions of Use

海拔高度不超过1000m；
环境温度：-25℃~+40℃，24小时内平均温度不超过+35℃；
水平倾斜度：不大于3°；
地震强度：不超过8级；
无剧烈震动和冲击及爆炸危险场所。

• The altitude does not exceed 1000m;
Ambient temperature:-25°C~+40°C, the average temperature within 24 hours does not exceed+35°C;
Horizontal inclination: no more than3°;
Earthquake intensity: no more than 8 levels;
No violent vibration and impact and explosion hazard.

结构特点 / Structural features

柜体采用优质角钢焊接而成；
断路器室位于柜体中（下）部，安装、调试、维护方便。标准配装VS1断路器，并设有压力释放通道，确保人身安全；
采用先进可靠的旋转式隔离开关，可在主母线带电下安全进入断路器室检修；
整柜防护等级IP2X；
设有可靠功能齐全的强制性机械闭锁装置，简便有效达到“五防”要求；
具有可靠的接地系统：
门上装有观察窗，可清楚观察到柜内元件的工作状态；
操作机构闭锁采用同XGN2-12柜用的JSXGN闭锁机构，简单可靠方便实用；
进出线电缆低于柜体前部，方便用户连接。

The cabinet is welded with high—quality angle steel;
The circuit breaker room is located in the middle(lower part) of the cabinet, which is convenient for installation, debugging and maintenance.Standard VS1 circuit breaker with pressure relief channel to ensure personal safety; Adopt advanced and reliable rotary isolating switch, which can safely enter the circuit breaker room for maintenance when the main bus is charged;
The whole cabinet protection grade IP2X;
It has a mandatory mechanical locking device with complete and reliable functions, which can easily and effectively meet the requirements of the "five—defence" interlocking mechanism;
Has a reliable grounding system;
The door is equipped with an observation window to clearly observe the working status of the components inside the cabinet;
The operating mechanism is locked with the JSXGN locking mechanism used in the XGN2-12 cabinet, which is simple, reliable, convenient and practical;
The incoming and outgoing cable is lower than the front of the cabinet for easy connection.

HXGN17-12

Product series



产品概述/Product Overview

HXGN17-12交流金属环网开关设备（真空开关）（简称环网柜），是为城市电网改造和建设需要而生产的新型高压开关设备。在供电系统中亦作为开断负荷电流和短路电流以及关合短路电流之用，本环网柜配用FZRN25、FZRN21真空负荷开关，操作机构为弹簧机构，该机构既可手动操作，也可电动操作。
接地开关和隔离刀配用手动操作机构，本环网柜成套性强、体积小、无燃烧和爆炸危险，还具有可靠的“五防”功能。
本环网柜符合GB3906《3-35kV交流金属封闭开关设备》、IEC60420《高压交流负荷开关熔断器组合电器》标准的有关规定。

HXGN17-12 AC metal ring network switchgear(vacuum switch)(referred to as ring network cabinet) is a new high-voltage switchgear produced for the transformation and construction of urban power grids. In the power supply system, it is also used as the breaking load current and short—circuit current and closing short—circuit current. The ring network cabinet is equipped with FZRN25 and FZRN21 vacuum loadswitch, and the operating mechanism is a spring mechanism. The mechanism can be operated manually or electric. operating. The grounding switch and the isolating knife are equipped with a manual operating mechanism. The ring network cabinet is strong in set, small in size, free from burning and explosion hazard, and has a reliable "five—proof"function.
The ring network cabinet complies with the relevant provisions of GB3906 "3—35kV AC metal—enclosed switchgear"and IEC60420 "High—voltage AC load switch fuse combination".

HXGN17-12 交流金属环网开关设备（真空开关）
AC metal ring network switchgear(vacuum switch)

型号含义 / Model meaning



使用条件/Conditions of Use

海拔高度不超过1000m；
环境温度：-15℃~+40℃；
相对湿度：日平均值不大于95%，水蒸气压力日平均值不超2.2kPa；月平均值不大于90%，水蒸气压力月平均值不超过1.8kPa；
地震强度：不超过8级；
没有腐蚀性或可燃性气体等明显污染的场所。

Altitude: no more than 1000m;
Ambient temperature: upper limit +40°C, lower limit-15°C;
Relative humidity: Humidity conditions: the daily average value is not more than 95%, the daily average value of water vapor pressure does not exceed 2.2kPa; the monthly average value is not more than 90%, and the monthly average value of water vapor pressure does not exceed 1.8kPa;
Earthquake intensity:no more than 8 levels;
There is no obvious pollution such as corrosive or flammable gas.

主要技术参数/Themaintechnicalparameters

项目Project		单位 Unit	FKN12-12	FZN25-12
额定电压Ratedvoltage		kV	12	
1min工频耐受电压Powerfrequencywithstandvoltage		kV	对地及相间42；隔离断口48 Earth and phase 42; isolation fracture 48	
雷电冲击电压（峰值）Lightningimpulsevoltage（peak）		kV	对地及相间75；隔离断口85 Ground and phase 75; isolation fracture 85	
额定频率Ratedfrequency		Hz	50	
主母线额定电流Mainbusbarratedcurrent		A	630	
负荷开关 Load switch	额定电流Ratedcurrent	A	630	
	额定电流下电寿命Ratedcurrentlife	次	不小于100	
	开断空载变压器容量 Breaking the capacity of the no-load transformer	kVA	1250	
	额定热稳定电流Ratedthermalstablecurrent	kA/s	20/4；接地开关Grounding switch20/2	
	额定动稳定电流（峰值）Rated dynamic current (peak)	kA	50	
	额定短路关合电流（峰值）Rated short circuit closing current (peak)	kA	50	
	熔断器额定电流Fuseratedcurrent	kA	100	
	额定转移电流Ratedtransfercurrent	kA	1500	2000
	额定短路开断电流Ratedshort-circuitbreakingcurrent	kA	315	
	配用熔断器型号Withfusetype		S□LAJ-12(XRNT□-10)	

MKCS

Low-voltage withdrawable switchgear



产品概述/Product Overview

MKCS是我公司引进国外产品先进技术开发一款新型低压开关设备，适用于发电厂、石油、化工、冶金、纺织、高层建筑等行业的配电系统。在大型发电厂、石化系统等自动化程度高，要求与计算机接口的场所，作为三相交流频率为50（60）Hz，额定工作电压为380V（400V），（660V），额定电流为6300A及以下的发、供电系统中的配电、电动机集中控制、无功功率补偿使用的低压成套配电装置。

MKCS is a new type of low—voltage switchgear developed by our company to introduce advanced technology of foreign products. It is suitable for power distribution systems in power plants, petroleum, chemical, metallurgy, textile, high—rise buildings and other industries. In large power plants, petrochemical systems, etc., where automation is high and the interface with the computer is required, the three—phase AC frequency is 50(60) Hz, the rated working voltage is 380 V(400 V),(660 V), and the rated current is 6300A and below. Low-voltage power distribution equipment for power distribution, power supply centralized control, and reactive power compensation in power supply and power supply systems.

MKCS 低压抽出式开关柜

Low-voltage withdrawable switchgear

型号含义 / Model meaning

MK C S - □ - □

- 主电路方案号Maincircuitschemenumber
- 辅助电路方案号Auxiliarycircuitschemenumber
- 电气系统ElectricalSystem
- 抽出式Withdraw
- 企业代号Enterprisecode

性能指标/Performance

装置的设计符合下列标准

IEC439-1 低压成套开关设备和控制设备
GB7251 低压成套开关设备
ZBK360001低压抽出式成套开关设备

The design of the device meets the following criteria

IEC439-1 low voltage switchgear and control equipment
GB7251 low voltage switchgear
ZBK360001 Low—voltage withdrawable switchgear

基本参数/Basicparameters

项目Project		参数Parameter	
主电路额定电压Maincircuitratedvoltage（V）		交流 AC 380（400）、（660）	
辅助电路额定电压Auxiliarycircuitratedvoltage（V）		交流AC220、380（400）	直流DC110/220
额定频率Ratedfrequency（Hz）		50 (60)	
额定绝缘电压Ratedinsulationvoltage（V）		660(1000)	
额定电流Ratedcurrent（A）	水平母线 Horizontal bus	≤6300	
	垂直母线 Vertical bus (MCC)	1000	
母线额定短时耐受电流 Busbar rated short-time withstand current (kA/1s)		50(80)	
母线额定峰值耐受电流 Busbar rated peak withstand current （ kA/0.1 s ）		105、176	
工频试验电压 Power frequency test voltage （ V/1min ）	主电路Themain circuit	2500	
	辅助电路 Auxiliary circuit	1760	
母线 Bus bar	三相四线制 Three-phase four-wire system	A、B、C、PEN	
	三相五线制 Three-phase five-wire system	A、B、C、PE、N	
防护等级 Protection level		IP30、IP40	

MKCS 低压抽出式开关柜

Low-voltage withdrawable switchgear

性能指标/Performance

主构架采用8MF型开口型钢，型钢的二侧面分别有模数为20mm和100mm和9.2mm的安装孔，内部安装灵活方便；
主构架装配形式设计为两种，全组装式结构和部份（侧框和横梁）焊接式结构，供用户选择；
装置的各功能室相互隔离，其隔室分为功能单元室、母线室和电缆室，各室的作用相对独立；
冰平主母线采用柜后平置式排列方式，以增强母线抗电动力的能力，是使装置的主电路具备高短路强度能力的基本措施；
电缆隔室的设计使电缆上下进出均十分方便。
装置通用柜体的尺寸（见下表）

The main frame adopts 8MF type open section steel. The two sides of the section steel have mounting holes of 20mm and 100mm and 9.2mm respectively. The internal installation is flexible and convenient;
The main frame assembly form is designed as two types, fully assembled structure and partial(side frame and beam) welded structure for users to choose;
The functional rooms of the device are isolated from each other, and the compartments are divided into functional unit rooms, busbar rooms and cable rooms, the role of each chamber is relatively independent;
The ice flat main busbar adopts the rear arrangement of the cabinet to enhance the busbar's ability to resist electric power, which is the basic measure to make the main circuit of the device have high short—circuit strength capability;
The design of the cable compartment makes it easy to access the cable up and down.
The size of the universal cabinet of the device(see table below)

高 H	2200									
宽W	400		600		800			1000		
深D	800	1000	800	1000	600	800	1000	600	800	1000

功能单元/Functionalunit

抽屉层高的模数为160mm。分为1/2单元、1单元、3/2单元、2单元、3单元、五个尺寸系列。单元回路额定电流400A及以下；
抽屉改变仅在高度尺寸上变化，其宽度、深度尺寸不变。相同功能单元的抽屉具有良好的互换性；
每台MCC柜最多能安装11个一单元的抽屉或22个1/2单元的抽屉。其中一单元以上抽屉采用多功能后板；
抽屉进出线根据电流大小采用不同片数的同一规格片式结构的插件；
1/2单元抽屉与电缆室的转接采用背板式结构ZJ-2型转接件；
单元抽屉与电缆室的转接按电流分档采用相同尺寸棒式或管式结构ZJ-1型转接件；
抽屉单元设有机械联锁装置。

The module height of the drawer is 160mm. Divided into 1/2 unit, 1 unit,3/2 unit,2 unit,3 unit, five size series. Unit circuit rated current 400A and below;
The drawer change only changes in height dimension, and its width and depth dimensions do not change. Drawers of the same functional unit have good interchangeability;
Each MCC cabinet can be installed with up to 11 one—unit drawers or 22 1/2—unit drawers. One or more of the drawers use a multifunctional rear panel;
The drawer inlet and outlet lines adopt different number of inserts of the same specification chip structure according to the current size;
1/2 unit drawer and cable room transfer adopts back plate type structure ZJ-2 type adapter;
The transfer of the unit drawer and cable compartment is made of the same size rod or tubular structure ZJ-1 type adapter according to the current division;
The drawer unit is equipped with a mechanical interlock.

MKCS 低压抽出式开关柜

Low-voltage withdrawable switchgear

主要电器元件/Mainelectricalcomponents

主要电器元件的选用原则立足于引进技术，国内既能成系列批量生产，又能满足装置高性能的要求；
电源及馈线单元断路器主选AH系列。也可选用其它性能更先进的Schneider公司生产的M系列、ABB公司生产的F系列。AH型断路器具有性能好、结构紧凑、重量较轻、系列性强的特点。价格相对较低，维护使用方便，各项性能指标能满足本装置的要求；
抽屉单元（电动机控制单元、部份馈电单元）断路器主选SM1、TG、TM30系列塑壳断路器。这些开关均有性能好，结构紧凑、短飞弧或无飞弧、技术经济指标高的特点，能满足本装置的要求；
隔离开关及熔断器式隔离开关选Q系列。该系列可靠性高、分断能力强，并可以实现机械联锁；
熔断器主选NT系列；
交流接触器选用B系列、LC1-D系列。

The selection principle of the main electrical components is based on the introduction of technology,and the domestic can be mass—produced in series,and can meet the requirements of high performance of the device;
The main line of the power supply and feeder unit circuit breaker is AH series. Other M—series from Schneider and A-Series from ABB are also available. The AH type circuit breaker has the characteristics of good performance, compact structure, light weight and strong series. The price is relatively low, easy to maintain and use, and various performance indicators can meet the requirements of the device;
Drawer unit(motor control unit, partial feed unit) circuit breaker main selection SM1, TG, TM30 series molded case circuit breaker. These switches have the characteristics of good performance, compact structure, short arc or no arcing, high technical and economic indicators, and can meet the requirements of this device;
The Q series is selected for the isolating switch and the fuse type isolating switch. The series has high reliability, strong breaking capacity and mechanical interlocking;
The main selection of fuses is NT series;
AC contactors are available in B series and LC1 -D series.

装置特点/Devicecharacteristics

提高转接件的热容量，较大幅度的降低由于转接件的温升给接插件、电缆头、间隔板带来的附加温升；
功能单元之间、隔室之间的分隔清晰、可靠，不因某一单元的故障而影响其它单元工作，使故障局限在最小范围；
母线平置式排列使装置的动、热稳定性好，能承受80/176kA短路电流的冲击；
MCC柜单柜的回路数量多到22回，充分考虑大单机容量发电，石化系统等行业自动化电动门（机）群的需要；
装置与外部电缆的连接在电缆隔室中完成，电缆可以上下进出。电流互感器装置于电缆隔室内，使安装维修方便；
同一电源配电系统，可通过限流电抗器匹配限制短路电流，稳定母线电压在一定的数值，还可部分降低对元器件短路强度的要求；
抽屉单元有足够数量的二次插接件（1单元及以上为32对，1/2单元为20对），可满足计算机接口和自控回路对接点数量的要求。

Increase the heat capacity of the adapter, and greatly reduce the additional temperature rise caused by the temperature rise of the adapter to the connector, cable head, and spacer;
The separation between functional units and compartments is clear and reliable. It does not affect the operation of other units due to the failure of one unit, so that the fault is limited to a minimum range;
The busbars are arranged in a flat arrangement to make the device have good dynamic and thermal stability and can withstand the impact of 80/176kA short—circuit current;
The number of circuits in MCC cabinets is up to 22 times, fully considering the needs of large single-unit capacity power generation, petrochemical systems and other industries for automated electric door(machine) groups;
The connection of the unit to the external cable is done in the cable compartment and the cable can be accessed up and down. The current transformer device is installed in the cable compartment to facilitate installation and maintenance;
The same power distribution system can limit the short—circuit current through the matching of the current limiting reactor, stabilize the bus voltage at a certain value, and partially reduce the requirements on the short—circuit strength of the components;
The drawer unit has a sufficient number of secondary connectors (32 pairs for 1 unit and above, and 20 pairs for 1/2 units), which can meet the requirements of the number of docking points for computer interface and automatic control loop.

MNS

Product series



产品概述/Product Overview

本系列低压抽出式开关柜是一种用标准模件由工厂组装（FBA）的组合式柜型，其技术已达到国际先进水平。
本系列低压抽出式开关柜适用于发电厂、变电站、石油化工、冶金轧钢、交通能源、轻工纺织等厂矿企业和住宅小区、高层建筑等场所、作为交流50~60Hz，额定工作电压交流660V及以下的电力系统的配电设备的电能转换、分配及控制之用。本装置符合GB72511《低压成套开关设备》及JB/T9961《低压抽出式成套开关设备》国家专业标准、并符合IEC439-1、VDE0660第五部分等国际专业标准。

This series of low—voltage withdrawable switchgear is a modular cabinet type assembled by factory (FBA) with standard modules, and its technology has reached the international advanced level.

This series of low—voltage withdrawable switchgear is suitable for power plants, substations, petrochemicals, metallurgical rolling steel, transportation energy, light industrial textiles and other factories and mines, residential quarters, high—rise buildings and other places, as AC 50—60Hz, rated working voltage AC 660V and The following power conversion, distribution and control of power distribution equipment of the power system. The device complies with GB72511 "Low—voltage switch equipment"and JB/T9961 "Low—voltage withdrawable switchgear"national professional standards, and meets the international professional standards such as IEC439—1 , VDE0660 and the fifth part.

MNS 低压抽出式开关柜
Low-voltage withdrawable switchgear

型号含义 / Model meaning

M N S □ □

- 主电路方案号Maincircuitschemenumber
- 辅助电路方案号Auxiliarycircuitschemenumber
- 电气系统ElectricalSystem
- 抽出式Withdraw
- 封闭式开关柜 Enclosed switchgear

使用条件/Conditions of Use

户内使用，海拔高度不超过2000m；

环境温度：-5℃~+40℃，并且24h平均温度不超过+35℃；

相对湿度：周围空气清洁，相对湿度在最高温度为+40℃时不超过50%，在较低温度时允许有较高的相对湿度，例如+25℃时为90%，但应考虑到由于温度变化可能会偶然产生适度的凝露；

地震强度：在无显著摇动和冲击震动的地方，不超过8级地震；

污染等级：3级；

开关柜运输和储存过程中的温度可在-25℃至55℃范围之间，在短时间内（不超过24h）温度可达到+70℃；

若上述使用条件不能满足时，应由用户和制造厂协商解决。

Altitude: Indoor use , no more than 2000m;

Ambient temperature: upper limit +40°C, lower limit-15°C,and the average temperature of 24 h is not higher than+35°C;

The surrounding air is clean, the relative humidity is not more than 50% at the highest temperature of +40°C, and the higher relative humidity is allowed at lower temperatures, for example,90% at +25 ° C, but it should be considered due to temperature changes. Occasionally produces moderate condensation;

Earthquake intensity:in places where there is no significant shaking or shock,and no more than 8 levels;

Pollution level:3;

The temperature during the transportation and storage of the switchgear can be between-25°C and 55°C, and the temperature can reach +70 C in a short time(not more than 24h);

If the above conditions of use cannot be met, it should be resolved by the user and the manufacturer.

主要技术参数/Themaintechnicalparameters

项目Project	参数Parameter
额定绝缘电压Ratedinsulationvoltage	690V/AC
额定工作电压Ratedoperatingvoltage	400V/AC
额定冲击耐受电压Ratedimpulsewithstandvoltage	8kV
额定频率Ratedfrequency	50~60Hz
主母线最大工作电流Mainbusbarmaximumoperatingcurrent	6300A
主母线额定耐受电流Mainbusbarratedwithstandcurrent	100kA
主母线额定峰值耐受电流 Main busbar rated peak withstand current	220kA
配电母线（垂直母线）最大工作电流 Distribution bus (vertical bus) maximum operating current	105、 1761200(2000A)
配电母线（垂直母线）短时峰值电流 Distribution bus (vertical bus) short-time peak current	176kA
防护等级Protectionlevel	IP30~IP54

MNS 低压抽出式开关柜
Low-voltage withdrawable switchgear

产品特点/Features

设计紧凑；以较小的空间能容纳较多的功能单元；

结构通用性强、组装灵活。以25mm为模数的C型型材能满足各种结构形式、防护等级及使用环境的要求；

采用标准模块设计：分别可组成保护、操作、转换、控制、调节、测定、指示等标准单元，用户可根据需要任意选用组装。以200余种组装件可以组装不同方案的柜架结构和组成固定分隔或抽屉单元；

安全性；大量采用高强度阻燃型的工程塑料组件，有效的加强防护安全性能；

技术性能高：主要参数达到当代国际水平；

装配方便：不需要特殊复杂工具。

Compact design: It can accommodate more functional units in a smaler space.

Strong structural versatility and flexible assembly.C-shaped profiles with a modulus of 25 mm can meet various structural forms, protection levels and operating environment requirements.

Standard module design: It can form standard units for protection, operation, conversion, control, adjustment, measurement, indication, etc.Users can choose assembly as needed. With more than 200 kinds of assemblies, it is possible to assemble different frame structures and components to form a fixed partition or drawer unit.

Safety:A large number of high—strength flame—retardant engineering plastic components are used to effectively enhance the safety performance.

High technical performance: The main parameters have reached the international level.

Easy assembly: no special complicated tools are required.

柜体结构/Cabinetstructure

开关柜柜体基本结构是由C型型材装配而成。C型型材是以E=25mm为模数安装孔的钢板弯制而成，采用自攻螺钉和8.8级螺栓组装而成。全部柜架及内层隔板均作镀锌处理。四周门板，侧板则作粉末喷涂，有效安装高度为72E。

The basic structure of the switchgear cabinet is assembled from C—shaped profiles. The C—shaped profile is made of a steel plate with a mounting hole of E=25 mm and assembled with self—tapping screws and 8.8 bolts.All cabinets and inner partitions are galvanized. The surrounding door panels and side panels are powder—coated and the effective installation height is 72E.

开关柜类型/Switchcabinettype

动力中心柜（PC）

采用固定安装抽出式开关，电流从630A到6300A的各种高分断容量，结构先进及智能化的断路器。

功率因数自动补偿柜（MDS-J），电动机控制中心柜（MCC）

抽屉式：由大小抽屉组装而成，各回路主开关采用高分断塑壳断路器或旋转式带熔断器的负荷开关。

固定式：MCC柜功能单元采用固定式安装插入式塑壳断路器的方式，既具有明显断点且增强安全性，同时又具有固定式柜可靠性好的优势。功能单元用钢板分隔，互相独立，单元结构紧凑，容量大，功能强。各类型功能单元可以在一个柜体内单一组装，也可以混合组装，其有效高度为72E，可根据方案自由组合。

Power Center Cabinet(PC)

It adopts fixed installation and draw—out switch, various high breaking capacity of current from 630A to 6300A, advanced structure and intelligent circuit breaker.

Power Factor Automatic Compensation Cabinet(MDS—J), Motor Control Center Cabinet(MCC)

Drawer type: It is assembled by large and small drawers. The main switch of each circuit adopts high-breaking molded case circuit breaker or rotary type load switch with fuse.

Fixed type: MCC cabinet function unit adopts the method of fixed installation and plug-in molded case circuit breaker, which not only has obvious break points and enhances safety, but also has the advantage of fixed cabinet reliability. The functional units are separated by steel plates, independent of each other, with compact unit structure, large capacity and strong function. Each type of functional unit can be assembled in a single cabinet or mixed and assembled. Its effective height is 72E, which can be freely combined according to the scheme.

GCK

Product series



产品概述/Product Overview

GCK低压抽出式开关柜由动力配电中心（PC）柜和电动机控制中心（MCC）二部分组成，适用于发电厂，变电站，工矿企业等电力用户作为交流50Hz，最大工作电压至660V，最大工作电流至3150A的配电系统中，作为动力配电，电动机控制及照明等配电设备的电能转换分配控制之用。

GCK low—voltage withdrawable switchgear consists of two parts: power distribution center (PC) cabinet and motor control center(MCC). It is suitable for power users such as power plants, substations, industrial and mining enterprises, etc. as AC 50Hz, maximum working voltage to 660V, maximum working. The current is distributed to the 3150A power distribution system for power distribution and distribution control of power distribution equipment such as power distribution, motor control and lighting.

GCK 低压抽出式开关柜

Low-voltage withdrawable switchgear

型号含义 / Model meaning

G C K - □

- 主电路方案号 Main circuit scheme number
- 用途代号 Use code
- 抽出式Withdraw
- 封闭式开关柜 Enclosed switchgear

使用条件/Conditions of Use

海拔高度不超过2000m；

环境温度：-50℃~+40℃，并且24h平均温度不超过+35℃；

大气条件：周围空气清洁，相对湿度在温度为+40℃时不超过50%，在温度较低时允许有较高的相对湿度，

例如：+20℃时为90%；

没有火灾，爆炸危险，严重污秽，化学腐蚀及剧烈震动的场所：

与垂直面倾斜不超过5°；

本产品适合以下温度运输储存：-25℃~+55℃，在短时间内（不超过24h）不超过+70℃；

Altitude: No more than 2000m;

Ambient temperature: upper limit +40°C, lower limit-50°C,and the average temperature of 24 h is not higher than+35°C;

• Atmospheric conditions: The air is clean,the relative humidity does not exceed 50% at a temperature of +40C,and a higher relative humidity is allowed at a lowe r temperature,for example， 90％ at + 20 ℃；

There is no fire, explosion hazard, serious pollution, chemical corrosion and severe vibration;

It is inclined no more than 5° from the vertical plane;

This product is suitable for the following temperature transportation and storage:-25°C~+55°C, in a short time(not more than 24h) does not exceed+70°C;

主要技术参数/Themaintechnicalparameters

项目Project		参数Parameter
额定工作频率Ratedoperatingfrequency（Hz）		50
额定工作电压Ratedworkingvoltage（V）		380、660
额定绝缘电压Ratedinsulationvoltage（V）		660
额定工作电流 Rated operating current (A)	水平母线、垂直母线 Horizontal busbar，vertical busbar	630-3150、600
额定短时耐受电流 Rated short-time withstand current		80kA（有效值）/1秒、50kA（有效值）/1秒 80kA (effective value) / 1 second, 50kA (effective value) / 1 second
额定峰值耐受电流 Rated peak withstand current		176kA/0.1s、 110kA/0.1s
主电路接插件Maincircuitconnector（A）		200、400
辅助电路接插件 Auxiliary circuit connector (A)		10
工频耐压1分钟Powerfrequencywithstandvoltagefor1minute（V）		2500
防护等级 Protection level		IP40
操作方式Operationmethod		就地，远方，自动 In situ，remote，automatic

GCS

Product series



产品概述/Product Overview

GCS装置适用于发电厂、石油、化工、冶金、纺织、高层建筑等行业的配电系统。在大型发电厂、石化系统等自动化程度高，要求与计算机接口的场所，作为三相交流频率为50（60）Hz，额定工作电压为380V（400V），（660V），额定电流为6300A及以下的发、供电系统中的配电、电动机集中控制、无功功率补偿使用的低压成套配电装置。

GCS devices are suitable for power distribution systems in power plants, petroleum, chemical, metallurgy, textile, and high—rise buildings. In large power plants, petrochemical systems, etc., where automation is high and the interface with the computer is required, the three—phase AC frequency is 50(60) Hz, the rated working voltage is 380V(400V),(660V), and the rated current is 6300A and below. Low—voltage power distribution equipment for power distribution, power supply centralized control, and reactive power compensation in power supply and power supply systems.

GCS 低压抽出式开关柜
Low-voltage withdrawable switchgear

型号含义 / Model meaning

G C S - □ - □

- 主电路方案号Maincircuitschemenumber
- 辅助电路方案号Auxiliarycircuitschemenumber
- 电气系统ElectricalSystem
- 抽出式Withdraw
- 封闭式开关柜 Enclosed switchgear

使用条件/Conditions of Use

海拔高度不超过2000m；

环境温度：-50℃~+40℃，并且24h平均温度不超过+35℃；

大气条件：周围空气清洁，相对湿度在温度为+40℃时不超过50%，在温度较低时允许有较高的相对湿度，
例如：+20℃时为90%；

没有火灾，爆炸危险，严重污秽，化学腐蚀及剧烈震动的场所；

与垂直面倾斜不超过5°；

本产品适合以下温度运输储存：-25℃~+55℃，在短时间内（不超过24h）不超过+70℃；

Altitude: No more than 2000m;

Ambient temperature: upper limit +40°C, lower limit-50°C,and the average temperature of 24 h is not higher than+35°C;

Atmospheric conditions: The air is clean,the relative humidity does not exceed 50% at a temperature of +40°C,and a higher relative humidity is allowed at a lower temperature,for example,90% at+20°C;

There is no fire, explosion hazard, serious pollution, chemical corrosion and severe vibration;

It is inclined no more than 5° from the vertical plane;

This product is suitable for the following temperature transportation and storage:-25°C~+55°C, in a short time(not more than 24h) does not exceed+70°C;

主要技术参数/Themaintechnicalparameters

项目Project		参数Parameter	
主电路额定电压 Main circuit rated voltage (V)		交流 AC380（400）、（660）	
辅助电路额定电压 Auxiliary circuit rated voltage (V)		交流AC220、380（400）	直流 DC110/220
额定频率 Rated frequency (Hz)		50(60)	
额定绝缘电压 Rated insulation voltage (V)		660(1000)	
额定电流 Rated current (A)	水平母线、垂直母线（MCC） Horizontal busbar，vertical busbar (MCC)	≤ 6300	
母线额定短时耐受电流 Busbar rated short-time withstand current(kA/1s)		50、80	
母线额定峰值耐受电流 Busbar rated peak withstand current (kA/0.1s)		105、176	
工频试验电压Powerfrequency test voltage (V/ 1min)	主电路、辅助电路 Main circuit, auxiliary circuit	2500、1760	
母线Busbar	三相四线制、三相五线制Three-phasefour -wire system, three-phase five-wire system	A,B,C,PEN、A,B,C,PE,N	
防护等级 Protection level		IP30 、 IP40	

GCS 低压抽出式开关柜
Low-voltage withdrawable switchgear

性能指标/Performance

装置的设计符合下列标准		The design of the device meets the following criteria	
IEC439-1	低压成套开关设备和控制设备	IEC439-1	Low voltage switchgear and control equipment
GB7251	低压成套开关设备	GB7251	Low voltage switchgear
ZBK360001	低压抽出式成套开关设备	ZBK360001	Low—voltage withdrawable switchgear

使用条件/Conditions of Use

主构架采用8MF型开口型钢，型钢的二侧面分别有模数为20mm和100mm和9.2mm的安装孔，内部安装灵活方便；
主构架装配形式设计为两种，全组装式结构和部分（侧框和横梁）焊接式结构，供用户选择；
装置的各功能室相互隔离，其隔室分为功能单元室、母线室和电缆室。各室的作用相对独立；
水平主母线采用柜后平置式排列方式，以增强母线抗电动力的能力，是使装置的主电路具备高短路强度能力的基本措施；
电缆隔室的设计使电缆上下进出均十分方便。
装置通用柜体的尺寸（见下表）

The main frame adopts 8MF type open section steel. The two sides of the section steel have mounting holes of 20mm and 100mm and9.2mm respectively. The internal installation is flexible and convenient.
The main frame assembly form is designed as two types, fully assembled structure and part(side frame and beam) welded structure for users to choose;
The functional rooms of the device are isolated from each other, and the compartments are divided into functional unit rooms, busbar rooms and cable rooms. The role of each chamber is relatively independent;
The horizontal main busbar adopts the rear arrangement of the cabinet to enhance the busbar's ability to resist electric power, which is the basic measure to make the main circuit of the device have high short—circuit strength capability;
The design of the cable compartment makes it easy to access the cable up and down.
The size of the universal cabinet of the device(see table below)

高 H	2200									
宽W	400		600		800			1000		
深D	800	1000	800	1000	600	800	1000	600	800	1000

使用条件/Conditions of Use

抽屉层高的模数为160mm。分为1/2单元、1单元、3/2单元、2单元、3单元、五个尺寸系列。单元回路额定电流400A及以下。
每台MCC柜最多能安装11个一单元的抽屉或22个1/2单元的抽屉。其中一单元以上抽屉采用多功能后板。
抽屉进出线根据电流大小采用不同片数的同一规格片式结构的插件。
1/2单元抽屉与电缆室的转接采用背板式结构ZJ-2型转接件。
单元抽屉与电缆室的转接按电流分档采用相同尺寸棒式或管式结构ZJ-1型转接件。
抽屉单元设有机械联锁装置。

The module height of the drawer is 160mm. Divided into 1/2 unit, 1 unit,3/2 unit,2 unit,3 unit, five size series. The unit circuit is rated at 400A or below.
The drawer change only changes in height dimension, and its width and depth dimensions do not change. Drawers of the same functional unit have good interchangeability.
The drawer inlet and outlet lines adopt different number of inserts of the same specification chip structure according to the current.
The 1/2 unit drawer and cable compartment are transferred using a backplane type ZJ-2 adapter.
The transfer of the unit drawer to the cable compartment is made of the same size rod or tube type ZJ-1 adapter according to the current division.
The drawer unit is equipped with a mechanical interlock.

GGD

Product series



产品概述/Product Overview

GGD型交流低压配电柜适用于发电厂、变电站、厂矿企业等电力用户的交流50Hz，额定工作电压380V，额定工作电流至3150A的配电系统，作为动力、照明及配电设备的电能转换、分配与控制之用。
GGD型交流低压配电柜是根据能源部主管上级与广大电力用户及设计部门的要求，本着安全、经济、合理、可靠的原则设计的新型低压配电柜。产品具有分断能力高、动热稳定性好、电气方案灵活、组合方便、系列性、实用性强、结构新颖、防护等级高等特点，可作为低压成套开关设备的更新换代产品使用。GGD型交流低压配电柜符合IEC439《低压成套开关设备和控制设备》，GB7251《低压成套开关设备》等标准。

GGD type AC low—voltage power distribution cabinet is suitable for power supply of power supply, lighting, power distribution equipment, power supply, power supply, lighting, power distribution equipment, power supply, power supply, lighting, power distribution equipment Distribution and control.
GGD—type AC low—voltage power distribution cabinet is a new type of low—voltage power distribution cabinet designed according to the requirements of the superior department of the Ministry of Energy and the majority of power users and design departments, based on the principles of safety, economy, reasonableness and reliability. The product has the characteristics of high breaking capacity, good dynamic thermal stability, flexible electric scheme, convenient combination, seriality, practicability, novel structure and high protection level. It can be used as a new generation of low—voltage switchgear. GGD type AC low voltage distribution cabinet complies with IEC439"Low—voltage switchgear and control equipment", GB7251 "Low—voltage switchgear"and other standards.

GGD 交流低压配电柜
AC low voltage distribution cabinet

型号含义 / Model meaning

G G D □ - □ □

辅助电路方案代号Auxiliarycircuitschemecode
主电路方案代号Maincircuitschemecode
设计序号：分断能力为15kA；分断能力为30kA；分断能力为50kA
Design serial number:breaking capacity is 15kA;breaking capacity is 30kA;breaking capacity is 50kA
电力用柜Powercabinet
电器元件固定安装、固定接线 Fixed installation and fixed wiring of electrical components
交流低压配电柜AClowvoltagedistributioncabinet

使用条件/Conditions of Use

周围空气温度不高于+40℃，不低于-5℃，24h内的平均温度不得高于+35℃；
户内安装使用，使用地点的海拔高度不得超过2000m；
周围空气相对湿度在最高温度为+40℃时不超过50%，应在较低温度时允许有较大的相对湿度（例如+20℃时为90%）考虑到由于温度的变化可能会偶然产生凝露的影响；
设备安装时与垂直面的倾斜度不超过5°；
设备应安装在无剧烈震动和冲击的地方，以及不足以使电器元件受到腐蚀的场所；
用户有特殊要求时可与制造厂协商解决。

GGD

The ambient air temperature is not higher than +40°C, not lower than-5°C, the average temperature within 24 h shall not be higher than +35°C;

Indoor installation and use, the altitude of the place of use shall not exceed 2000m;

The relative humidity of the surrounding air does not exceed 50% at the maximum temperature of +40°C. It should allow a large relative humidity at a lower temperature(for example,90% at +20°C). Considering that the temperature may change accidentally Produce the effects of condensation;

The inclination of the equipment when installed is not more than 5° with the vertical plane;

• The equipment should be installed in places where there is no severe vibration and shock, and where it is not enough to corrode electrical components;

•Users can negotiate with the manufacturer if they have special requirements.

主要技术参数/Themaintechnicalparameters

型号Model	额定电压 Rated voltage (V)	额定电流 Rated current (A)		额定短路开断电流 Rated short-circuit breaking current (KA)	额定短时耐受电流 Rated short-time withstand current (1s) (kA)	额定峰值耐受电流 Rated peak withstand current (KA)
GGD1	380	A	1000	15	15	30
GGD1	380	B	600(630)	15	15	30
GGD1	380	C	400	15	15	30
GGD2	380	A	1500(1600)	30	30	63
GGD2	380	B	1000	30	30	63
GGD2	380	C	600	30	30	63
GGD3	380	A	4000	50	50	105
GGD3	380	B	2500	50	50	105
GGD3	380	C	2000	50	50	105

GGD 交流低压配电柜

AC low voltage distribution cabinet

结构特点/Structuralfeatures

GGD型交流低压配电柜的柜体采用通用柜的形式，框架用8MF冷弯型钢经局部焊接组装而成，构架零件及专用配套零件由型钢定点生产厂配套供货，以保证柜体的精度和质量。通用柜的零部件按模块原理设计，并有20模的安装孔。通用系数高，可以使工厂实现预生产，既缩短了生产制造周期，也提高了工作效率。

GGD柜按现代工业产品造型设计的要求，采用黄金分割比的方法设计柜体外形和各部分的分割尺寸，使整柜美观大方，面目一新。

柜门用转轴式活动铰链与框架相连，安装、拆卸方便，门的折边处均嵌有一根山型橡塑条，关门时门与框架之间的嵌条有一定压缩行程，能防止门与柜体直接碰撞，也提高了门的防护等级。

装有电器元件的仪表门用多股软铜线与框架相连，柜内的安装件与框架间用滚花螺钉连接，整柜构成完整的接地保护系统。

柜体面漆选用聚脂桔形烘漆，具有附着力强，质感好，整柜呈亚光色调，避免了眩目效应，给值班人员创造了较舒适的视觉环境。

柜体的顶盖在需要时可拆除，便于现场主母线的装配和调整，柜顶的四角装有吊环，用于起吊和装运。

柜体的防护等级为IP30，用户也可根据使用环境的要求在IP20--IP40之间选择。

GGD / MKXL-21

The cabinet of GGD AC low—voltage power distribution cabinet adopts the form of universal cabinet. The frame is assembled by partial welding of 8MF cold—formed steel. The frame parts and special supporting parts are supplied by the fixed—point steel production plant to ensure theaccuracy of the cabinet. And quality. The components of the universal cabinet are designed according to the principle of the module and have 20—mode mounting holes. The high universal factor allows the factory to achieve pre-production, which shortens the manufacturing cycle and increases work efficiency.

According to the requirements of modern industrial product design, the GGD cabinet adopts the golden ratio method to design the shape of the cabinet and the division size of each part, so that the whole cabinet is beautiful and fresh.

The hinged hinge of the cabinet door is connected with the frame, which is convenient for installation and disassembly.A mountain-shapedrubber strip is embedded in the folded edge of the door. When the door is closed, the insert between the door and the frame has a certain compression stroke, which can prevent the door and the cabinet. Direct collision of the body also increases the degree of protection of the door.

The instrument door with electrical components is connected to the frame by a plurality of soft copper wires. The mounting parts in the cabinet are connected with the frame by knurled screws, and the whole cabinet constitutes a complete grounding protection system.

The cabinet topcoat is made of polyester orange baking varnish, which has strong adhesion and good texture. The whole cabinet has a matt color tone, which avoids the dazzling effect and creates a more comfortable visual environment for the duty personnel.

The top cover of the cabinet can be removed when needed to facilitate the assembly and adjustment of the main busbar on the site. The four corners of the cabinet top are equipped with lifting rings for lifting and shipping.

The protection level of the cabinet is IP30, and the user can also choose between IP20--IP40 according to the requirements of the use environment.

电气性能/Electricalperformance

主电路方案/Maincircuitscheme

GGD柜的主电路设计了129个方案，共298个规格（不包括辅助电路的功能变化及控制电压的变化而派生的方案和规格）；

其中：GGD1型49个方案123个规格：GGD2型53个方案107个规格：GGD3型27个方案68个规格；

主电路方案是征求了广大设计、使用部门的意见选编的，增加了发电厂需要的方案。额定电流至3150A，适合2000kVA及以下的配电变压器选用。此外，为适应无功补偿的需要设计了GGJ1、GGJ2电容补偿柜，其主电路方案4个，共12个规格。

The main circuit of the GGD cabinet is designed with 129 schemes and a total of 298 specifications(excluding the functional changes of the auxiliary circuits and the control schemes and specifications derived from the control voltage);

Among them: GGD1 type 49 schemes 123 specifications; GGD2 type 53 schemes 107 specifications; GGD3 type 27 schemes 68 specifications;

The main circuit plan is to solicit the opinions of the vast number of design and use departments, and increase the need for power plants. The rated current is up to 3150A, suitable for distribution transformers of 2000kVA and below. In addition, in order to meet the needs of reactive power compensation, GGJ1 and GGJ2 capacitor compensation cabinets are designed. The main circuit scheme is 4, with a total of 12 specifications.

MKXL-21

Low-voltage power distribution cabinet



产品概述/Product Overview

MKXL-21型低压动力配电柜适用于发电厂及工矿企业中，在交流电压500伏及以下的三相四线系统作动力配电之用。

MKXL-21型低压动力配电箱系户内装置靠墙安装，屏前检修。

MKXL—21 low—voltage power distribution cabinet is suitable for power distribution in power plants and industrial and mining enterprises.It is used for three-phase four-wire system with AC voltage of 500 volts or less.

The MKXL—21 low—voltage power distribution box is installed indoors against the wall and is screened for maintenance.

MKXL-21

MKXL-21 低压动力配电柜
Low-voltage power distribution cabinet

型号含义 / Model meaning

MK X L - 21 □

- 方案号Plannumber
- 设计序号DesignNumber
- 动力控Powercontrol
- 控制箱Controlbox
- 企业代号 Enterprise code

结构特征/Structure

MKXL-21型低压动力配电柜系封闭式，外壳用钢板压制而成，刀开关操作手柄装于前右柱上部，可以作为切换电源之用。配电箱前面装有一只电压表，指示母线的电压。配电箱前面有门，门打开后配电箱内全部设备露、便于检修维护。本配电箱用用国内自行设计的型组件，具有结构紧凑，检修方便，线路方案可以灵活组合等特点。配电箱除装有空气断路器和熔断器作为短路保护外，还装有接触器和热继电器，箱前门可装操作按钮和指示灯。

The MKXL—21 low—voltage power distribution cabinet is enclosed, and the outer casing is made of steel plate. The knife switch operating handle is mounted on the upper part of the front right column and can be used as a switching power source.A voltmeter is placed in front of the distribution box to indicate the voltage of the bus. There is a door in front of the distribution box. After the door is opened, all the equipment in the distribution box is exposed, which is convenient for maintenance and repair. The distribution box uses domestically designed components, which has the characteristics of compact structure, convenient maintenance and flexible combination of line schemes. In addition to the air circuit breaker and fuses, the distribution box is equipped with a contactor and a thermal relay. The front door of the box can be equipped with operation buttons and indicator lights.

主要技术参数/Themaintechnicalparameters

刀熔组合开关/Knifefusionswitch

型号 Model	额定电流Ratedcurrent（A）	熔体额定电流Meltratedcurrent（A）	备注Remarks
HR3-630/34	630	150、200、250、300、350、400、500/630	装隔离刀片时无溶体 No solution when installing the isolation blade

空气断路器/Aircircuitbreaker

型号Model	额定电流Ratedcurrent（A）	脱扣器整定电流Tripunitsettingcurrent（A）	备注Remarks
MLM5-40/390	40	10、15、20、30、40	
MLM1-630/3300	630	100、225、400、500、630	
MLM1-630/3300	630	100、250、315、400、500、630	

电流互感器/CurrentTransformer

型号Model	初级电流Primarycurrent（A）	次级电流Secondarycurrent（A）	备注Remarks
LM-0.5	75、100、150、200、300、600	5	

MKXL-21 / JP

电流互感器/CurrentTransformer

型号Model	额定电流Ratedcurrent（A）	次级电流Secondarycurrent（A）	备注Remarks
MLC3-10	10	交流 AC110/220/380	
MLC3-20	20	交流 AC110/220/380	
MLC3-40	40	交流 AC110/220/380	
MLC3-80	80	交流 AC110/220/380	
MLC3-150	150	交流 AC110/220/380	

JP

Product series



产品概述/Product Overview

JP系列户外综合配电箱，是集计量、出线、无功补偿等多功能于一体达到户外综合配电装置，具有短路、过载、过电压、漏电保护等功能，体积小、外型美观、经济实用，安装于户外柱上变压器的电杆上，是城乡电网改造的新一代理想配电产品。

JP series outdoor integrated distribution box is a comprehensive integrated power distribution device integrating metering, outlet, reactivepower compensation, etc. It has the functions of short circuit, overload, over voltage and leakage protection. It is small in size, beautiful in appearance and economical. Practical, installed on the pole of the outdoor column transformer, is a new generation of ideal power distribution products for urban and rural power grid transformation.

JP 户外综合配电箱
Outdoor integrated distribution box

型号含义 / Model meaning

JP - □ - □

- 主回路方案号Maincircuitschemenumber
- 变压器容量 Transformer capacity
- 综合配电箱 Integrated distribution box

使用条件/Conditions of Use

海拔高度：不大于2000m；
环境温度：-25℃~+40℃；
空气相对湿度：日平均值不大于90%，月平均值不大于90%；
安装在无剧烈震动和冲击、无腐蚀性气体的场所。

•Altitude: no more than 2000m;
Ambient temperature:-25°C~+40°C;
•Relative humidity of air: the daily average is not more than 90%, and the monthly average is not more than 90%;
•Installed in a place where there is no severe vibration and shock, no corrosive gas.

JP

结构特点/Structuralfeatures

箱体结构分立式和卧式，外壳采用2mm优质不锈钢板经多重折边工艺弯制（或采用蜂窝结构的不锈钢双夹层复合板，具有阻燃、环保、隔热、防凝露等性能），采用特殊不锈钢焊接工艺，箱体成型后整体强度高，表面光洁如镜，不留焊缝痕迹；内部安装梁（板）为热镀锌工艺处理，确保二十年内不锈蚀；箱体前后开门，便于用户操作和检修，门四周镶有高弹力耐老化密封胶条，每扇门均装有明暗两种门锁，明锁配有防堵防锈的遮雨罩；计量室全封闭带铅封装置；箱体侧面装有防雨防异物的进线电缆穿管，底部冲有通风孔和电缆出线孔，顶部设有通风道和丝网，具有防水、防锈、防尘、防异物的功能，防护等级：IP54。

The box structure is divided into vertical and horizontal type. The outer shell is made of 2mm high—quality stainless steel plate and bent by multiple hemming process(or stainless steel double—layer composite board with honeycomb structure, which has the properties of flame retardant, environmental protection, heat insulation and anti—condensation). The special stainless steel welding process is adopted. After the box is formed, the overall strength is high, the surface is smooth as a mirror, and no weld marks are left. The inner mounting beam(plate) is treated by hot—dip galvanizing to ensure no corrosion in 20 years; It is easy for users to operate and overhaul. The door is surrounded by high—elastic anti—aging sealing strips. Each door is equipped with two kinds of door locks, light and dark. The lock is equipped with a rain cover for anti—blocking and rust prevention. The measuring chamber is fully enclosed with lead. Sealingdevice; the side of the box is equipped with a rain—proof and foreign—proof incoming cable, the bottom is flushed with ventilation holes and cable outlet holes, and the top is provided with ventilation ducts and screens, which are waterproof, rust-proof, dust-proof and foreign-proof. Function, protection level: IP54.

主要技术参数/Themaintechnicalparameters

项目Project	单位Unit	参数Parameter
变压器容量Transformercapacity	kVA	30-400
额定工作电压Ratedoperatingvoltage	V	AC400
辅助回路工作电压 Auxiliary circuit operating voltage	V	AC220、AC380
额定频率Ratedfrequency	Hz	50
额定电流Ratedcurrent	A	≤ 630
额定漏电动作电流Ratedleakagecurrent	mA	30~300可调 Adjustable
防护等级 Protection level		IP54

JP 户外综合配电箱
Outdoor integrated distribution box





JP / MKXF











MKXF

Construction site distribution box



产品概述/Product Overview

适用于交流频率50Hz、额定工作电压500V以下电路中。在特殊要求下，防护等级可达到P55，箱体上，下均有敲落孔，多管进线可预留活装开孔板，最大额定电流可达400A，特别适用于工矿、宾馆、民用住宅楼等用户计量控制箱。

Applicable to circuits with AC frequency 50Hz and rated working voltage below 500V. Under special requirements, the protection level can reach IP55. There are knockout holes on the upper and lower sides of the box. The multi—tube inlet can reserve the living hole opening plate.The maximum rated current can reach 400A, which is especially suitable for industrial, mining, hotel and civil use. User measurement control box such as residential building.

MKXF 基业箱
Foundation box

型号含义 / Model meaning

MK X F □ □ □ / □ □

- 安装方式：M明装，R暗装，W户外
  Installation method:M mounted, R concealed , W outdoor
- 箱体深度Boxdepth（cm）
- 箱体宽度Boxwidth（cm）
- 箱体高度 Box height (cm)
- 铰链代号：1-表示暗铰链、2-表示明铰链
  Hinge code: 1 —indicates a dark hinge and 2—indicates a hinge
- 表示防护型Representingprotection
- 挂墙式控制箱Wall-mountedcontrolbox
- 企业代号Enterprisecode

使用条件/Conditions of Use

海拔高度不超过2000m；
环境温度：-5℃~+40℃；
相对湿度：最温度为+40℃时，空气的相对湿度不超过50%，在较低的温度下可以允许较高的相对湿度，例如：+20℃时达90%；
安装类别：Ⅱ类；
污染等级：3级；
额定工作电压：230V400V；
额定工作电压：400A；
额定短路分断能力：80kA；
外壳防护等级：IP55。

The altitude does not exceed 2000m;
Ambient temperature:-5°C~+40°C;
Relative humidity:When the maximum temperature is +40 C the relative humidity of the air does not exceed 50%. At lower temperatures, higher relative humidity can be allowed, for example,90% at+20°C;
Installation category:Class II;
Pollution level:Level3;
Rated working voltage:230V 400V;
Rated working voltage:400A;
Rated short-circuit breaking capacity:80kA;
Shell protection rating:IP55.

PZ30

Product series



产品概述/Product Overview

PZ30-A终端组合配电箱系列主要结构部件有透明罩、上盖、箱体、安装轨、轨道高低调节螺杆、导电排、护线罩和电器开关元件等。内装电器开关元件全部采用宽度9mm模数的电器，安装于顶帽形轨道上，可根据需要任意组合，安装轨道高低可调节，特别对暗装式更为方便。拆装迅速方便、开关元件手柄外露，带电及其它部分遮盖于上盖内部，打开门可方便地操作，使用安全可靠，箱体上下、左右及背后均设置进出线孔，便于接线。
PZ30-B（原型号PZ30X）模数化终端组合配电箱系列分明装/暗装两种类型。是一种安装模数为9mm终端电器的装置，它适用于交流50Hz，额定电压220V与380V的住宅、车站、商业网和工矿企业的配电中作为对用电设备进行控制，对过载、短路、过电压和漏电起保护作用的一种成套装置。

The main structural components of the PZ30—A terminal combination distribution box series include transparent cover, upper cover, box body, mounting rail, track height adjusting screw, conductive row, wire shield and electrical switch components. The built-in electrical switch components are all equipped with electric appliances with a width of 9mm and are mounted on the top hat-shaped track. They can be combined according to the needs. The height of the installation rail can be adjusted, especially for the concealed type. The disassembly andassembly is quick and convenient, the handle of the switch component is exposed, and the electrified and other parts are covered inside the upper cover. The door can be easily operated, and the use is safe and reliable. The inlet and outlet holes are arranged on the upper, lower, left and right sides of the cabinet to facilitate wiring.
PZ30-B(formerly PZ30X) modular terminal combination distribution box series is divided into two types: fixed/concealed.It is a device with 9mm terminal electrical equipment. It is suitable for residential, station, commercial network and industrial mine with AC 50Hz, rated voltage of 220V and 380V. The enterprise's power distribution is a complete set of devices that control the electrical equipment and protect against overload, short circuit, over voltage and leakage.

PZ30 配电箱
Distribution box

产品规格/Productspecifications（mm）

名称Name	规格Specification	高High	宽Width	深Deep
额定电压Ratedvoltage	6#	200	188	90
	8#	200	224	90
	10#	260	260	90
	12#	260	296	90
	15#	260	350	90
	18#	260	404	90
	20#	260	440	90
	24#	450	296	90
	30#	450	350	90
	36#	450	404	90

名称Name	规格Specification	高High	宽Width	深Deep
PZ30-B 明装大型箱体尺寸 Surface mounted large cabinet size	6#	230	200	90
	8#	230	240	90
	10#	280	280	90
	12#	280	310	90
	15#	280	370	90
	18#	280	420	90
	20#	280	460	90
	24#	470	310	90
	30#	470	370	90
	36#	470	420	90
	40#	470	460	90
	45#	630	370	90
	54#	630	420	90

GZDW

Product series



产品概述/Product Overview

GZDW系列（微机控制）直流电源柜是针对无人值守变电所对直流电源柜所提出的要求而研制开发的新一代替换产品。适用于大中小型发电厂和变电站，在正常运行和事故状态下的高压开关分合闸、继电保护、自动控制、事故照明等所需的直流电源。

GZDW series(microcomputer control) DC power supply cabinet is a new generation replacement product developed for unattended substation's requirements for DC power supply cabinets. It is suitable for large and medium—sized power plants and substations, DC powersupply for high—voltage switch opening and closing, relay protection, automatic control, accident lighting, etc. under normal operation and accident conditions.

GZDW（微机控制）直流电源柜

(Microcomputer control)DC power supply cabinet

型号含义 / Model meaning

G Z D W □ □ □ □

- G镉镍电池M铅酸电池 G cadmium nickel battery M lead acid battery
- 额定电压Ratedvoltage（V）
- 蓄电池容量Batterycapacity（AH）
- 设计序号DesignNumber
- 微机控制 Microcomputer control
- 电力系统PowerSystems
- 直流电器柜DCelectricalcabinet
- 柜式Cabinettype

功能特点/Features

具有主充、均充、浮充的充电状态选择，电压方便可调。具有稳压限流及稳流限压的功能选择。

微机监控单元采用大屏幕、全中文液晶显示，显示内容包括电池电压、充电电流、控母电压、充电机输出电压、电流、单节电池电压及直流系统的一系列参数。

交流失电后重新投入，系统可根据电池的容量自动选择最佳充电方式对电池进行充电。微机监控单元退出系统后，不影响直流系统的正常运行。

- With charging status of main charging, equal charging and floating charging, the voltage is convenient and adjustable. It has the function selection of constant current limiting and steady current limiting.
- The microcomputer monitoring unit adopts large screen and full Chinese liquid crystal display. The display contents include battery voltage, charging current, control voltage, charger output voltage, current, single battery voltage and a series of parameters of DC system.
- After the AC is powered off and re—input, the system can automatically select the best charging method to charge the battery according to the battery capacity. After the microcomputer monitoring unit exits the system, it does not affect the normal operation of the DC system.

基本参数/Basicparameters

项目Project	参数Parameter
输入电压 Input voltage	AC380V±10%
输出电压Theoutputvoltage	DC220V、 DC110V、 DC48V
输出电流Outputcurrent	10、20、30、40、50、60、100、200A
稳压精度 Voltage regulation accuracy	≤1
稳流精度 Steady flow accuracy	≤1
纹波系数 Ripple coefficient	≤1
整机噪声Machinenoise	≤55db
主变温升Maintemperaturerise	≤60°C
工作方式 Way of working	连续工作Continuouslyworking

PK

Product series



产品概述/Product Overview

PK系列微机保护测控屏应用于35kV及以下电压等级的变（配）电站，为站内各高压设备提供智能化、网络化的测量、保护和控制功能，同时与上级主站进行实时通讯，实现变（配）电站的综合自动化。该系列产品的主要功能包括：线路的各种保护及测量控制变压器的差动保护、后备保护及测量控制；电容器、电动机的各种保护及测量控制：母线分段、进线备自投等测控功能。

PK series microcomputer protection measurement and control screen is applied to 35kV and voltage level variable(distribution) power station, providing intelligent and networked measurement, protection and control functions for each high—voltage equipment in the station, and real—time communication with the upper—level main station. Comprehensive automation of transformers. The main functions of this series of products include: various protection of the line and differential protection of the measurement and control transformer, backup protection and measurement control; various protection and measurement control of capacitors and motors: bus section, incoming line, self—injection, etc.features.

PK微机保护测控屏

Microcomputer protection measurement and control screen

使用条件/Conditions of Use

户内使用，海拔高度不超过2500m；

环境温度：-5℃~+40℃，并且24h平均温度不超过+36℃；

相对湿度：在周围空气温度为+40℃时不超过50%；在较低温度下可以有较高的相对湿度（如：+20℃时为90%），考虑到温度的变化允许产生适度的凝露，设备安装时与垂直面的倾斜度应不超过5°；

设备应安装在无剧烈震动、无冲击及无腐蚀的场所。

• Altitude: Indoor use , no more than 2500m;

Ambient temperature: upper limit +40°C, lower limit-5°C,and the average temperature of 24 h is not higher than+36°C;

Relative humidity: no more than 50% when the ambient air temperature is +40C; higher relative humidity at lower temperatures(eg 90% at+20C), allowing for moderate temperature in consideration of temperature changes Condensation, the inclination of the equipment when installed and the vertical plane should not exceed5°;

The equipment should be installed in a place where there is no severe vibration, no impact and no corrosion.

主要性能/Mainperformance

采用超高速双CPU系统并行工作，功能强大，本产品所有测控保护单元均采用Inte公司推出的80C196芯片，其速度是8096的两倍，芯片本身包含所有外围电路，硬件设计极其简化，将保护、控制、测量、通讯等功能合理的分散到两个CPU芯片并行处理，以保证在其中一个CPU发生故障时能够自动切换任务，极大地提高了系统的处理能力，使系统运行更可靠、更安全，并留有较多的冗余量，利于用户的升级和扩展，有效的防止了系统满负荷工作。

全COMSE工业级优选芯片，整屏功耗低，本产品所有集成电路全部采用工业级COMS芯片，功耗大大降低，同时系统噪声容限大大提高，抗干扰能力增强。

高可靠设计，抗恶劣环境，符合IEC国际标准本产品的专门设计适用于强磁干扰，元器件及插接件接触可靠，耐冲击、耐振动，工作环境温度范围宽，绝缘、耐压、冲占、以及抗高频干扰等指标符合IEC国际标准。

通讯网高速、可靠，网上所有设备互不影响，本产品采用了专用的RS-485网络通讯芯片，容错能力强，可靠性高，并采用光电隔离措施，充分保证了网上所有设备的安全，每个接口本身还具有自测试系统，便于公用网上故障的快速维修。当检测到通讯口故障时，能自动与通讯总线隔离。

It adopts ultra-high speed dual CPU system to work in parallel and has powerful functions. All the measurement and control protection units of this product adopt the 80C196 chip introduced by Inte, and its speed is twice that of 8096. The chip itself contains all peripheral circuits, and the hardware design is extremely simplified and will be protected. The functions of control, measurement, communication, etc. are distributed to two CPU chips for parallel processing to ensure that the task can be automatically switched when one of the CPUs fails, which greatly improves the processing capability of the system and makes the system run more reliable and safer. And leave more redundancy, which is conducive to user upgrades and expansions, effectively preventing the system from working at full capacity.

Full COMSE industrial grade preferred chip, low power consumption of the whole screen. All integrated circuits of this product adopt industrial grade COMS chip, the power consumption is greatly reduced, the system noise tolerance is greatly improved, and the anti—interference ability is enhanced.

Highly reliable design, resistant to harsh environments, in line with IEC international standards. This product is specially designed for strong magnetic interference, reliable contact of components and connectors, impact resistance, vibration resistance, wide working temperature range, insulation, withstand voltage, Indicators such as impulse occupation and anti—high frequency interference comply with IEC international standards.

• The communication network is high—speed and reliable. All the devices on the network do not affect each other. This product uses a dedicated RS—485 network communication chip, which has strong fault tolerance, high reliability, and optical isolation measures to ensure the safety of all devices on the network. The interfaces themselves also have a self-test system to facilitate rapid maintenance of public network faults. When the communication port is detected to be faulty, it can be automatically isolated from the communication bus.

DFW-12

Product series



产品概述/Product Overview

欧式电缆分接箱是近年来广泛用于电力配网系统中的电缆化工程设备，它的主要特点是双向开门、利用穿墙套管作为连接母排，具有长度小、电缆排列清楚、三芯电缆不需要大跨度交叉等显著优点。其所采用的电缆接头符合DIN47636标准。一般采用额定电流630A螺栓固定连接式电缆接头。

European cable distribution box is a cable engineering equipment widely used in power distribution network systems in recent years. Its main features are two-way opening, using wall bushings as connecting busbars, with small ength, clear cable arrangement, and three cores. Cables do not require significant advantages such as large span crossing. The cable connector used is in accordance with DIN47636.Generally, the rated current 630A bolted connection cable connector is used.

DFW-12 欧式电缆分接箱
European cable distribution box

型号含义 / Model meaning

DFW - □ - □ □

- A为带避雷器，缺省为不带
  A is the lightning arrester by default.
- 回路数（一相中进出线总数）
  Number of loops (total number of incoming and outgoing lines in one phase)
- 电压等级Voltagelevel
- 电缆分接箱 Cable distribution box

使用条件/Conditions of Use

环境温度：最高气温：+40℃，最低气温：-30℃；
风速：相当34m/s（不大于700Pa）；
湿度：日相对湿度平均值不大于95%，月相对湿度平均值不大于95%；
防震：水平加速度不大于0.4m/s3，垂直加速度不大于0.15m/s；
安装地点倾斜度：不大于3°；
安装环境：周围空气不受腐蚀性、可燃性气体、水蒸气等明显污染，安装地点无剧烈震动。
注：订购本产品超出上述条件规定时，请与本公司协商。

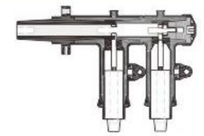
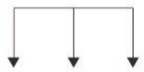
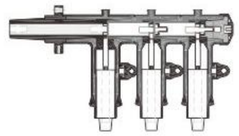
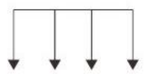
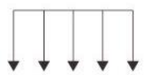
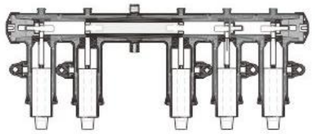
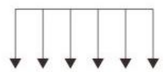
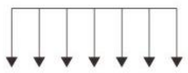
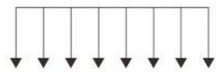
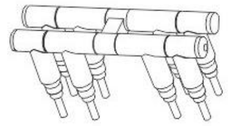
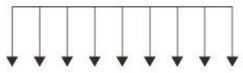
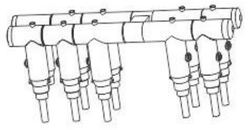
Ambient temperature: maximum temperature:+40°C, minimum temperature:-30°C;
• Wind speed: quite 34m/s(not more than 700Pa);
•Humidity: the average daily relative humidity is not more than 95%, and the average monthly relative humidity is not more than 95%;
•Anti—vibration: the horizontal acceleration is not more than 0.4m/s?, and the vertical acceleration is not more than 0.15m/s;
Installation site inclination: no more than 3°;
•Installation environment: The surrounding air is not polluted by corrosive, flammable gases, water vapor, etc., and there is no severe vibration at the installation site.
Note: When ordering this product beyond the above conditions, please consult with the company.

主要技术参数/Themaintechnicalparameters

项目Project	参数Parameter
额定电压Ratedvoltage	12kV
额定电流Ratedcurrent	630A
动稳定电流Dynamicsteadycurrent	50kA/0.3s
热稳定电流 Thermally stable current	20kA/3s
1min工频耐压Powerfrequencywithstandvoltage	42kV
15分钟直流耐压15minutesDCwithstandvoltage	52kV
雷电冲击耐压Lightningimpulsewithstandvoltage	105kV
箱体防护等级Boxprotectionlevel	IP33

DFW-12 欧式电缆分接箱
European cable distribution box

订货编号说明/Ordernumberdescription

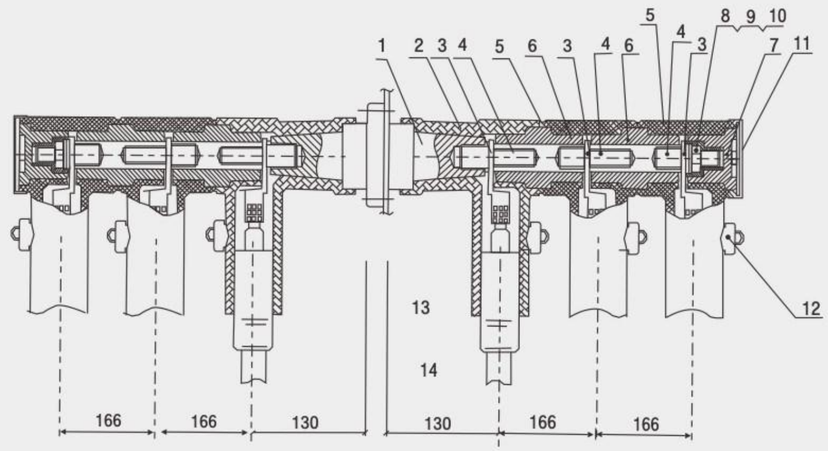
项目Project	接线方案Wiringscheme	内部排列 Internal alignment	外形尺寸 Dimensions (mm)
DFW10-2			580×550×950
DFW10-3			700×550×950
DFW10-4			820×550×950
DFW10-5			940×550×950
DFW10-6			1060×550×950
DFW10-7			1180×550×950
DFW10-8			820×650×1000
DFW10-9			940×650x1000

DFW-12 欧式电缆分接箱
European cable distribution box

欧式电缆分接箱内分布图/Europeancabledistributionboxdistributionmap



欧式接头示意图/Europeanjointschematic



1、设备套管　2、可触摸前接头　3、接线线鼻　4、双头螺栓　5、可触摸后接头
6、中间接头　7、绝缘塞　8、平垫图　9、弹簧垫图　10、螺母
11、防护帽　12、测试帽　13、应力锥　14、电缆（分支）

DFW

Product series



产品概述/Product Overview

DFW型低压电缆分支箱箱体采用DFW复合材料经高温模压成型，具有良好的抗冲击、抗弯曲强度、抗老化、耐磨擦、耐腐蚀、耐电弧、高阻燃、绝缘强度高、安装便利等优点，能够满足户外工程项目中各种恶劣环境和场所的需要，适用于城乡电网改造、市政工程、居民小区及高层建筑等公共场所的输配电，作为控制和保护之用。

DFW low—voltage cable branch box body is molded by high temperature molding with DFW composite material, which has good impact resistance, bending strength, anti—aging, abrasion resistance, corrosion resistance, arc resistance, high flame retardancy, high insulation strength and convenient installation. It can meet the needs of various harsh environments and places in outdoor engineering projects, and is suitable for transmission and distribution in public places such as urban and rural power grid reconstruction, municipal engineering, residential quarters and high—rise buildings, as control and protection.

DFW 低压电缆分支箱
Low voltage cable branch box

使用条件/Conditions of Use

周围环境温度不高于+45℃、不低于-35℃，24h的平均温差不得大于35℃；
使用地点的海拔高度不超过5000m；
周围空气相对湿度在最高温度为+45℃时不超过50%，在较低温度使用时允许有较大的相对湿度（+22℃时为80%）应考虑到由于温度的变化可能会偶然产生凝露的影响；
设备应安装在无剧烈震动和冲击的地方，以及不足使电器元件受到腐蚀的场所；
特殊环境条件下使用，应由用户和我公司协商解决。

The ambient temperature is not higher than +45°C, not lower than -35°C, and the average temperature difference of 24h shall n ot exceed35 ℃ ;

• The altitude of the place of use does not exceed 5000m;

The relative humidity of the surrounding air does not exceed 50% at the highest temperature of +45°C. It is allowed to have a relatively large relative humidity when used at a lower temperature (80% at +22 C). It should be considered that the temperature may change accidentally.

•Produce the effects of condensation; The equipment should be installed in places where there is no severe vibration and shock, and where there is insufficient corrosion of electrical components;

• Use under special environmental conditions should be resolved by the user and our company.

外形及安装尺寸/Shapeandinstallationdimensions（mm）



名称Name	高度heightH1+H	宽度widthW	深度depthD
低压电缆分支箱 Low voltage cable branch box	870	600	320
DFW低压电缆分支箱（落地式）Low-voltage cable branch box (floor type)	870+280	600	320
DFW低压电缆分支箱 Low voltage cable branch box	870	800	320
DFW低压电缆分支箱（落地式）Low-voltagecablebranchbox（floortype）	870+280	800	320
DFW低压电缆分支箱（落地式）Low-voltage cable branch box (floor type)	870+280	800	320

XGW-12/24

Product series



产品概述/Product Overview

XGW-12-24kV环网箱（开闭所）是新一代模块化、多功能组合、高可靠性、结构紧凑且免维护的环网开关设备，适用于10~35kV供电线路的环网供电或双辐射供电，亦可用于终端供电，对被供电的地区能起到电能的控制和保护作用。广泛应用于供电负荷密度大，用电缆馈电网络的城市环网配电及大型工厂、居民小区等。

XGW-12~24kV环网箱（开闭所）主要由SF6气体绝缘封闭紧凑型开关设备（C-GIS）和金属（或非金属）外箱体组成，所有高压带电部分封闭在SF6气体绝缘的不锈钢箱体内，按用户需要可按照进线单元、出线单元、计量单元、联络单元、PT（电源）单元等排列自由组合，并可加载配电自动化系统，安装简单、通风良好、美观环保、无凝露问题、不受环境影响。

在环网柜中只需配备上配电自动化终端设备（FTU/RTU）与通讯装置，即可与配电自动化系统的控制中心进行通讯，而且可进行线路的电压、电流等多种电量的测量、监控各开关的工作状态。

XGW-12~24kV ring cage(opening and closing) is a new generation modular, multi-functional combination, high reliability, compact and maintenance-free ring network switchgear. It is suitable for ring network power supply of 10-35kV power supply line or Double-radiation power supply can also be used for terminal power supply, which can control and protect electric energy in the area to be powered. It is widely used in urban ring network power distribution with large power supply load density, cable feeder network, large factories and residential quarters.

The XGW—12—24kV ring cage(opening and closing) is mainly composed of SF6 gas insulated closed compact switchgear (C—GIS) and metal(or non—metal) outer casing. All high voltage electrified parts are enclosed in SF6 gas insulated. The stainless steel box body can be freelycombined according to the user's needs according to the incoming line unit, the outlet unit, the metering unit, the contact unit, the P T (power supply unit), and can be loaded with the distribution automation system. The installation is simple, the ventilation is good, the appearance is environmentally friendly, and there is no Condensation problems, not affected by the environment.

In the ring network cabinet, only the distribution automation terminal equipment (FTU/RTU) and communication device can be equipped to communicate with the control center of the distribution automation system, and various voltages such as voltage and current of the line can be measured. Monitor the working status of each switch.

XGW-12~24kV 环网箱（开闭所）

Ring cage(opening and closing)

型号含义 / Model meaning

X G W - 12 - 20 - □

- 设计序号DesignNumber
- 额定短时耐受电流Ratedshort-timewithstandcurrent（kA）
- 电压等级 Voltage level (kV)
- 户外型Outdoortype
- 固定式Fixed
- 箱式Boxtype

使用条件/Conditions of Use

环境温度：+45℃~-35℃，最大温差≤25℃；
海拔高度：≤4000m；湿度：相对湿度日平均值<95%；水蒸气压力日平均值<2.2kPa；月相对湿度平均值<90%；月水蒸气压力平均值<1.8kPa;
抗震能力：地震强度不超过8度；
周围空气应不受腐蚀性或可燃性气体、水蒸气等明显污染；
对于户外高压环网柜在超出正常使用条件情况下使用时，需与制造厂协商并取得一致意见。

Ambient temperature:+45°C~-35°C, the maximum temperature difference ≤25°C;
Altitude:≤4000m;
•Humidity: daily average value of relative humidity <95%; daily average value of water vapor pressure <2.2kPa; average value of monthly relative humidity <90%; average value of monthly water vapor pressure <1.8kPa;
• Earthquake resistance: the seismic intensity does not exceed 8 degrees;
• The surrounding air should be free from corrosive or flammable gases, water vapor, etc.;
• When the outdoor high—voltage ring network cabinet is used beyond the normal use conditions, it is necessary to negotiate with the manufacturer and obtain a consensus.

主要技术参数/Themaintechnicalparameters

项目Project		单位 Unit	参数Parameter	
额定电压Ratedvoltage		kV	12/24	
额定频率Ratedfrequency		Hz	50/60	
额定电流Ratedcurrent		A	630/1250/1600/2000	
额定绝缘水平 Rated insulation level	工频耐受电压 Power frequency withstand voltage	kV	相间，相对地 Relatively	一次隔离断口 Separate isolation fracture
			42/65	48/79
	雷电冲击耐受电压 Lightning impulse withstand voltage	kV	75/125	85/145
	辅助控制回路工频耐受电压 Auxiliary control loop power frequency withstand voltage	V	2000	
额定短路开断电流（有效值）Rated short-circuit breakingcurrent（effectivevalue）		kA	16、20、25、31.5	
额定关合电流（峰值）Rated closing current (peak)			40、50、63、80	
额定动稳定电流（峰值）Rated dynamic current (peak)			40、50、63、80	
额定热稳定电流（有效值）Rated thermal stability current (RMS)			16、20、25、31.5	
辅助控制回路额定电压 Auxiliary control loop rated voltage		V	DC48,DC/AC110,220	
防护等级 Protection level			外壳 shell（IP44），气箱 Gas box（IP67）	

XGW-12~24kV 环网箱（开闭所）
Ring cage(opening and closing)

设备技术参数/Equipmenttechnicalparameter

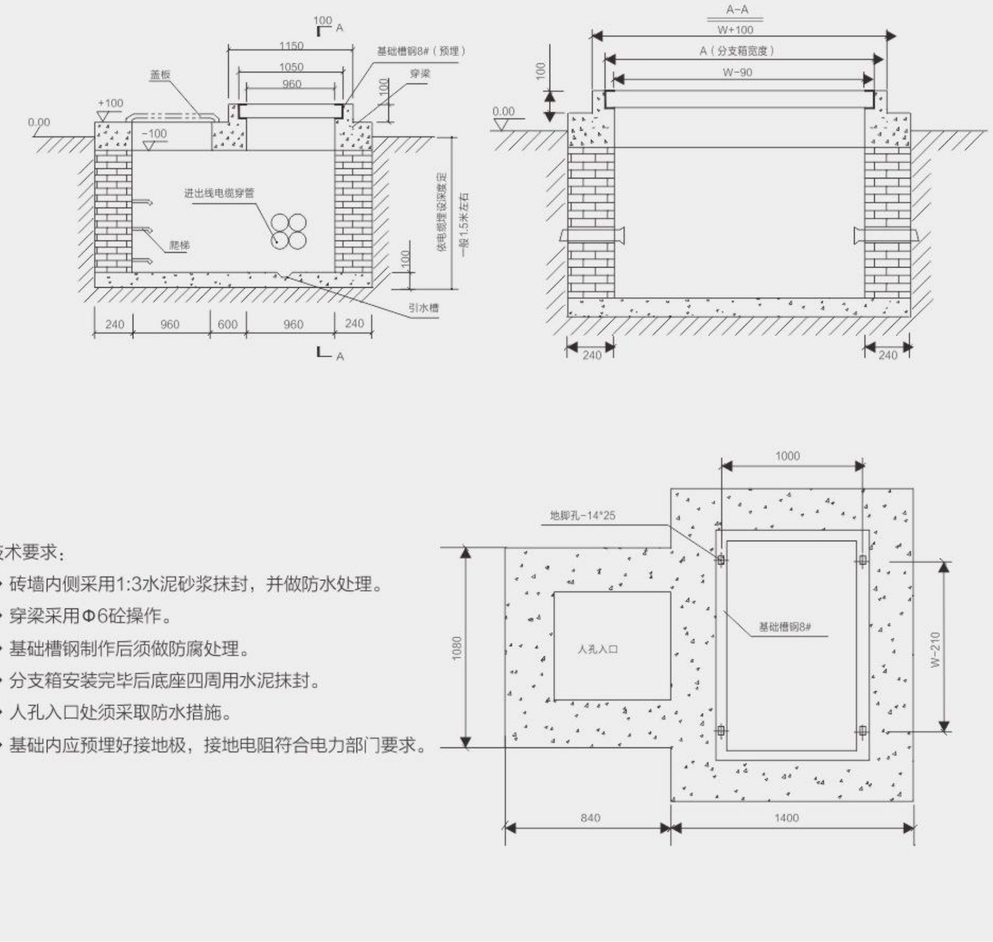
项目Project			单位 Unit	负荷开关单元 Load switch unit	组合电器单元 Combined electrical unit	断路器单元 Circuit breaker unit
额定电压Ratedvoltage			kV	12/24		
额定频率Ratedfrequency			Hz	50/60		
主母线额定电流Mainbusbarratedcurrent			A	630、1250		
额定电流Ratedcurrent			A	630	125	630、1250
额定短路开断电流Ratedshort-circuitbreakingcurrent			kA/次		31.5	20、25/30
额定短路关合电流（峰值） Rated short circuit closing current (peak)			kA	50	80	50、63
额定短时耐受电流 Rated short-time withstand current	主回路4s/接地回路4s Main circuit 4s/ground circuit 4s		kA	25		20、25
	接地连接回路4s Ground connection circuit 4s			17.4		17.4、21.7
额定峰值耐受电流 Rated peak withstand current	主回路/接地回路 Main circuit/ground circuit		kA	50		50、63
	接地连接回路 Ground connection loop			43.5		43.5、54.6
额定转移电流Ratedtransfercurrent			A	1750(12kV)/1400(24kV)		
开断、关合能力Breakingandclosingability				E3级 level		E2级level
额定绝缘水平 Rated insulation level	1min工频耐压 Power frequency withstand voltage	相对地、相间Relatively	kV	42(12kV)/65(24kV)		
		真空断口、隔离断口 Vacuum fracture, isolation fracture		48(12kV)/79(24kV)		
	雷电冲击耐受电压（峰值） Lightning impulse withstand voltage(peak)	相对地、相间Relatively		75(12kV)/125(24kV)		
		真空断口、隔离断口 Vacuum fracture, isolation fracture		85(12kV)/145(24kV)		
辅助回路1min工频耐压 Auxiliary circuit 1 min power frequency withstand voltage			kV			
额定单个/背对背电容器组开断电流 Rated single/back to back capacitor bank breaking current			A			400
额定电容器组关合涌流 Rated capacitor bank			kA			20(50Hz)
机械寿命 Mechanical life	负荷开关/接地开关 Load switch/earthing switch		次 Time	5000/3000	5000/3000	
	断路器/隔离开关 Circuit breaker/disconnector					10000/3000
SF_6 气体额定压力（20℃相对值） SF_6 gas rated pressure（20 ℃ relative value）	设计水平及额定充入水平 Design level and rated filling level		Mpa	0.04		
	最低功能水平 Minimum functional level			0.02		
	压力释放装置释放压力 Pressure relief device releases pressure			0.14		
防护等级 Protection level	密封气箱 Sealed airbox			IP67		
	开关设备外壳 Switchgear housing			IP4X		
密封性能 Sealing performance				年漏气率 Annual leak rate≤0.01%		

XGW-12~24kV 环网箱（开闭所）
Ring cage(opening and closing)

安装尺寸 / Installation size

开关设备单元为XGW-12~24时，户外高压环网柜（开闭所）安装尺寸

When the switchgear unit is XGW-12~24, the outdoor high-voltage ring network cabinet (opening and closing) installation size



技术要求：

- ◆ 砖墙内侧采用1:3水泥砂浆抹封，并做防水处理。
- ◆ 穿梁采用Φ6砼操作。
- ◆ 基础槽钢制作后须做防腐处理。
- ◆ 分支箱安装完毕后底座四周用水泥抹封。
- ◆ 人孔入口处须采取防水措施。
- ◆ 基础内应预埋好接地极，接地电阻符合电力部门要求。

	三单元Threeunits	四单元Fourunit	五单元Fiveunits	六单元 Six units
A	1530	1855	2180	2555
B	1060	1060	1060	1060

MKPH-E(H)

Product series



产品概述/Product Overview

针对当前配变台区存在的电能质量问题，我公司开发了智能台区三相不平衡自动调节装置，该装置结合了静止发生器（TDLBQ）和静止无功补偿（MKDR）技术，采用统一的控制器对TDLBQ单元和ZMDR单元进行协调控制，既控制TDLBQ单元的补偿电流输出，又控制MKDR单元的自动投切。在调节设备无功输出时，采用TDLBQ单元粗调ZMDR单元微调的方式，可实现系统三相功率因数实时为1，同时，作为一种有源型补偿产品，该装置还具有平衡三相电流、谐波滤除及电压支撑的功能。

In view of the power quality problems existing in the current distribution area, our company has developed a three—phase unbalanced automatic adjustment device for smart station, which combines the static generator (TDLBQ) and static reactive power compensation (MKDR) technology, using a unified The controller performs coordinated control on the TLDBQ unit and the MKDR unit, and controls both the compensation current output of the TDLBQ unit and the automatic switching of the MKDR unit. When the reactive output of the device is adjusted, the three—phase power factor of the system can be realized in real time by using the fine adjustment of the MKDR unit of the TDLBQ unit. At the same time, as an active compensation product, the device also has a balanced three—phase current. Harmonic filtering and voltage support functions.

MKPH-E(H) 智能台区三相不平衡自动调节装置

Intelligent three-zone unbalanced automatic adjustment device

产品功能/Product Features

平衡三相电流：最低线路损耗；降低变压器温升；提高变压器带载能力；

稳定电压：抑制闪变：稳定电网电压；保障用电设备安全运行；

谐波治理：降低线路损耗：降低变压器温升：延长用电设备使用寿命；保障保护装置可靠运行。

- •Balance three—phase current: lowest line loss; reduce transformer temperature rise; improve transformer load capacity;
- • Stable voltage: suppress flicker; stabilize the grid voltage; ensure the safe operation of electrical equipment;
- •Harmonic control: reduce line loss; reduce transformer temperature rise; extend the service life of electrical equipment; ensure reliable operation of protection devices.

主要技术参数/Themaintechnicalparameters

项目Project	参数Parameter
输入电压范围 Input voltage range	40V±20%
额定频率Ratedfrequency（Hz）	50±5%
额定容量 Rated capacity (kvar)	30/40/50/75/100/150/200 60（20）/90（60）/120（90）/150（120）/其他容量可定制 Other capacity can be customized
接线方式Wiring	三相四线Three-phasefour-wire
过载能力Overloadcapability（A）	1.2倍额定电流（有效值）1.2 times rated current (effective value)
控制架构 Control architecture	DSP+EPGA+ARM数字控制系统 Digital control system
开关器件频率Switchingdevicefrequency（Hz）	≥20k
功耗（额定输出） Power consumption (rated output)	≤2.5%(ZMDR);<2%(ZMDR+TDLBQ)
工作模式 Operating mode	不平衡电流补偿+电压控制+谐波滤除+无功补偿 Unbalanced current compensation+ voltage control+harmonic filtering + reactive power compensation
谐波电流补偿率 Harmonic current compensation rate	≥ 90%
响应时间Responsetime	≤5ms
人机界面HMI	LCD彩色显示屏/触摸屏可选 LCD color display/touch screen optional
通讯方式Communicationmethod	485通信、GPRS通信、以太网可选 485 communication, GPRS communication, Ethernet optional
保护功能Protectivefunction	过压保护，欠压保护，同步信号丢失保护，相序异常保护，主回路器件保护等 Overvoltage protection, undervoltage protection, synchronous signal loss protection, phase sequence abnormal protection, main circuit device protection, etc.
冷却方式 Cooling method	强制风冷Forcedaircooling
噪声Noise	≤60dB
无故障时间 Trouble free time	≥ 100,000h
箱体材质Boxmaterial	不锈钢 Stainless steel
防护等级Protectionlevel	IP20~IP54（可定制 Customizable）

TDLBQ

Product series



产品概述/Product Overview

TDLBQ有源电力滤波器是动态滤除谐波的新一代谐波治理解决方案，采用先进的动态实时跟踪补偿方式消除电网谐波，通过实时监测由非线性负载所产生的电流波形，分离出谐波部分，将大小相对，方向相反的谐波电流注入到电网中，实现滤除谐波的功能。各项技术性能指标均达到国内外同类产品同等水平，成本和技术都有革命性突破，新型工艺设计使机器体积大大减小，节省了机房宝贵的空间，大大降低了企业用户使用有源滤波器技术的门槛。

TDLBQ是一种基于电流检测和电流注入技术的大功率电力电子装置。工作原理为：通过实时检测负载电流波形，得到需要补偿的谐波电流成分，并将其反向，通过控制GBT的触发，将反向电流注入供电系统，实现滤除（抵消）谐波功能，从而提高电气系统安全可靠性、达到节能增效的目的。

TDLBQ可以被看作是一个电流源，在主连接处提供一个谐波电流，这个谐波电流与非线性负荷产生的总谐波电流是反向的。在连接GF-TDLBQ有源滤波器和负荷之前，网络仍然以基波电流运行。

因为TDLBQ有源滤波器的补偿电流是有规则的，因此其补偿质量是独立于网络阻抗和由电压谐振、下降、闪变引起的电源电压失真。补偿电流的内部界定是防止由过电流引起的设备破坏，其他连接在电源上的负荷并没有由于并联有源滤波而受到影响。这些尤其应用在脉动控制系统。

TDLBQ active power filter is a new generation harmonic control solution for dynamic filtering of harmonics. It uses advanced dynamic real—time tracking compensation to eliminate harmonics of the power grid. By monitoring the current waveform generated by the nonlinear load in real time, the harmonic is separated. In the wave part, the harmonic currents of opposite magnitudes and opposite directions are injected into the power grid to realize the function of filtering out harmonics. All technical performance indicators have reached the same level of similar products at home and abroad, and both cost and technology have revolutionized breakthroughs. The new process design has greatly reduced the size of the machine, saving valuable space in the machine room and greatly reducing the use of active filters by enterprise users. The threshold of technology.

TDLBQ 有源电力滤波装置

Active power filter

TDLBQ is a high power power electronics based on current sensing and current injection technology. The working principle is: by detecting the load current waveform in real time, obtaining the harmonic current component to be compensated, and inverting it, by controlling the trigger ofthe IGBT, injecting the reverse current into the power supply system, thereby filtering(offsetting) the harmonic function, Thereby improving the safety and reliability of the electrical system, achieving the purpose of energy saving and efficiency.

TDLBQ can be thought of as a current source that provides a harmonic current at the main junction that is opposite to the total harmonic current produced by the non—linear load. The network still operates at the fundamental current before connecting the GF—TDLBQ active filter and load.

Because the compensation current of the TDLBQ active filter is regular, its compensation quality is independent of the network impedance and the supply voltage distortion caused by voltage resonance, falling, and flicker. The internal definition of the compensation current is to prevent equipment damage caused by overcurrent, and other loads that are also connected to the power supply are not affected by parallel active filtering. These are especially used in pulsation control systems.

主要技术参数/Themaintechnicalparameters

谐波补偿Harmoniccompensation	
补偿容量Compensationcapacity	50A/100A/150A/200/300A（可定制）模块、柜式自由并联扩展容量 (customizable) module, cabinet free parallel expansion capacity
输入 Input	
接线方式Wiring	三相三线/三相四线Three-phasethree-wire/three-phasefour-wire
工作电压 Operating Voltage	380V-40%~+20%
工作频率Workingfrequency	50Hz-10%~+10%
性能指标Performance	
整机效率Machineefficiency	>97%
滤波能力Filteringability	THDi（电濾畸变率 Electric distortion rate）<5%
滤波范围 Filter range	2~50次
响应时间Responsetime	<300uS
全响应时间 Full response time	<10ms
中性线滤波能力Neutrallinefilteringcapability	3倍于相线 3 times the phase line
IGBT频率Frequency	30kHz（等效频率Equivalentfrequency）
自诊断及保护功能Self-diagnosisandprotection	有Have
通讯接口 Communication Interface	RS232RS485
通讯协议 Protocol	Modbus协议Protocol
安装方式 Installation method	壁挂/机架 Wall/rack
防护等级Protectionlevel	IP30
防雷保护Lightningprotection	20kV
可并联台数 Parallel number	不限 Unlimited
CT互感器Transformer	100/5-4000/5
环境条件Environmentalconditions	
环境温度Ambienttemperature	0°C~ 40°C
储存温度Storagetemperature	-20°C~70°C
相对湿度Relativehumidity	最大95%，无凝露 95%maximum，no condensation
海拔高度Altitude	<1500m，1500-4000m之间，根据国标GB/T3859.2，每增加100m，功率降低1% < 1500m, 1500-4000m, according tothe national standard GB/T3859.2. the power is reduced by 1 %for every 100m increase

MKTBBZ

Product series



产品概述/Product Overview

MKTBBZ系列高压无功自动补偿装置根据6kV.10KV供电母线的电网及负荷状况，通过控制系统电容器组自动跟踪投切，进行无功功率自动跟踪补偿，功率因数达到0.9以上。极大的优化电能质量、节损降耗，提高输配电系统的输送容量。

MKTBBZ series high—voltage reactive power automatic compensation device automatically tracks and switches the reactive power capacitors according to the grid and load conditions of the 6kV and 10kV power supply busbars, and the reactive power automatic tracking compensationis achieved. The power factor is above 0.9. Greatly optimize power quality, reduce losses and reduce transmission capacity of transmission and distribution systems.

MKTBBZ 高压无功自动补偿装置

High voltage reactive power automatic compensation device

型号含义 / Model meaning

MK TBB Z □ □ - () □□□

- 尾注Endnote1，2，3
- 组数及每组容量（G为固定补偿）
- Number of groups and each group capacity (G is fixed compensation)
- 补偿容量Compensationcapacity（kvar）
- 额定工作电压Ratedoperatingvoltage（kV）
- 分组自动投切Groupautomaticswitching
- 并联电容补偿成套装置 Parallel capacitor compensation complete device
- 企业代号Enterprisecode

例如：MKTBBZ10-1500（600+900）-AK表示电压为10kV，装置容量为1500kvar，分两组自动投切，一组600kvar，一组900kvar，单星型接线，开口三角电压保护。

For example: MKTBBZ10—1500 (600+900) —AK means voltage is 10kV, device capacity is 1500kvar, automatic switching is divided into two.groups, one set is 600kvar, one set is 90okvar, single star type wiring, open triangle voltage protection.

使用条件/Conditions of Use

海拔高度：不高于1000m；

环境温度：-25℃~+55℃；

相对湿度：不超过85%；

运行场所不允许有爆炸危险的介质，周围介质中不应含有腐蚀性和破坏绝缘的气体及导电介质，不允许充满水蒸汽及有严重的细菌存在。

•Altitude: no more than 1000m ;

Ambient temperature:-25℃ ~+55℃;

•Relative humidity: no more than 85%;

• The explosion—proof medium is not allowed in the operation place. The surrounding medium should not contain corrosive and insulatino gas and conductive medium. It is not allowed to be filled with water vapor and serious mold

MKTBBZ / VS1-12

主要技术参数/Themaintechnicalparameters

项目Project	单位 Unit	参数Parameter
额定电压Ratedvoltage	kV	6-10
额定频率Rated frequency	Hz	50
额定容量 Rated Capacity	kvar	100-10000
分组数量 Number of groups		1-5组
电抗器参数选择 Reactor parameter selection		抑制合闸涌流，电抗率为0.1-1%；抑制5次以上谐波 电抗率为6%；抑制3次以上谐波，电抗率为12% Inhibition of the inrush current, the reactance rate is 0.1-1%; suppressing the harmonics of more than 5 times, the reactance rate is 6%; suppressing the harmonics of more than 3 times, the reactance rate is 12%

VS1-12

Product series



产品概述/Product Overview

VS1-12型户内高压真空断路器，系三相交流50Hz额定电压为12KV电力系统的户内开关设备，作为电网设备、工矿企业动力设备的保护和控制单元。适用于要求在额定工作电流下的频繁操作，或多交开断短路电流的场所。
该断路器采用操动机构与断路器本体一体式设计，即可做为固定安装单元，也可配有专用推进机构，组成手车单元作用。

VS1—12 type indoor high voltage vacuum circuit breaker is a three—phase AC 50Hz indoor switchgear with rated voltage of 12kV power system. It is used as protection and control unit for power equipment and industrial and mining enterprise power equipment. Applicable to places that require frequent operation at rated operating current, or where excessive short—circuit current is required.
The circuit breaker adopts an integrated design of the operating mechanism and the circuit breaker body, and can be used as a fixed installation unit, or can be equipped with a special propulsion mechanism to form a hand truck unit.

VS1-12 户内高压真空断路器
Indoor High Voltage Vacuum Circuit Breaker

型号含义 / Model meaning

VS 1 - 12 / □ - □

- 额定短路开断电流 Rated short-circuit breaking current（kA）
- 额定电流Ratedcurrent（A）
- 额定电压Ratedvoltage（kV）
- 设计序号DesignNumber
- 户内高压真空断路器 Indoor high voltage vacuum circuit breaker

VS1-12 / MKM65-12

主要技术参数/Themaintechnicalparameters

项目Project	单位Unit	参数Parameter		
额定电压 Rated voltage	kV	12		
额定绝缘水平 Rated insulation level：额定雷电冲击耐受电压峰值 Rated lightning impulse withstand voltage peak	kV	75		
额定绝缘水平 Rated insulation level：1min工频耐压 Power frequency withstand voltage	kV	42		
额定短路开断电流 Rated short-circuit breaking current	kA	20/25	31.5	40
额定电流Ratedcurrent	A	630 1250	630,1250,1600 2000, 2500, 3150	630,1250,1600 2000, 2500, 3150
额定热稳定电流（有效值）Ratedthermalstabilitycurrent（RMS）	kA	20/25	31.5	40
额定稳定电流（峰值）Rated dynamic current（peak）	kA	63	80	100
额定短路关合电流（峰值）Rated short circuit closing current（peak）	kA	63	80	100
额定短路开断电流开断次数Ratedshort-circuitbreakingcurrentbreakingtimes	次	50		
二次回路工频耐受电压（1min）Secondary circuit power frequency withstand voltage	V	2000		
额定操作顺序Ratedoperationsequence		O-0.3-CO-180s-CO O-180s-CO-180s-CO		
额定热稳定时间Ratedheatsettlingtime	s	4		
额定单个背对背电容器组开断电流 Rated single/back to back capacitor bank breaking current	A	630/400800/400(40kA)		
机械寿命Mechanicallife	次	20000		

MKM65-12

Product series



产品概述/Product Overview

MKM65-12系列户内固封极柱高压真空断路器，适用于额定电压7.2-12kV，频率50Hz的三相交流电力系统中，广泛应用于电厂、变电站、石化、冶金、制造业、机场和小区等，作为电器设施的保护和控制之用，尤其适用于额定电流下频繁操作或多次开断短路电流的场所，可装于移开式或固定式空气绝缘开关柜。产品符合GB1984《交流高压断路器》、DL/T403《12-40.5kV户内交流高压断路器订货技术条件》及IEC60694、IEC6227-100等相关标准要求。MKM65-12系列户内固封极柱高压真空断路器采用先进的APG工艺，将真空灭弧室及主导电回路直接固封在环氧树脂极柱内而形成固封绝缘方式，代表着当今世界上高压真空断路器设计及制造的最高水平。

注：本型号产品的真空灭弧室固封极柱换成普通绝缘筒的安装方式时，型号为VS1-12.

MKM65-12

MKM65-12 series indoor solid-sealed pole high-vollage vacuum circuit breaker, suitable for three—phase AC power system with rated voltage of 7.2—12kV and frequency of 50Hz, widely used in power plants, substations, petrochemicals, metallurgy, manufacturing, airports and communities. For the protection and control of electrical facilities, it is especially suitable for places wit frequent operation under rated current or multiple times of breaking short-circuit current. It can be installed in removable or fixed air—insulated switchaear. The product comolies with GB 1984 "AC high voltage circuit breaker" , DL/T403 "12—40.5k V indoor AC high voltage circuit breaker ordering technical conditions"and IEC60694. IEC6227—100 and other related standards.MKM65—12 series indoor solid-sealed pole high-voltage vacuum circuit breaker adopts advanced APG process to directly seal the vacuum interrupter and main conductive loop in the epoxy pole to form a solid-sealed insulation method, representing the worid today. The highest level of design and manufacture of high voltage.vacuum circuit breakers.
Note: When the vacuum interrupter solid—sealed pole of this model is replaced with the ordinary insulation cvlinder, the model number is VS1—12.

MKM65-12 户内固封极柱高压真空断路器

Indoor solid-sealed pole high voltage vacuum circuit breaker

型号含义 / Model meaning

MKM 65 - 12 / □ - □

- □ 额定短路开断电流Ratedshort-circuitbreakingcurrent（kA）
- □ 额定电流Ratedcurrent（A）
- 12 额定电压Ratedvoltage（kV）
- 65 设计序号DesignNumber
- MKM 户内固封极柱高压真空断路器 Indoor solid-sealed pole high voltage vacuum circuit breaker

使用条件/Conditions of Use

海拔高度：不超过2000m；
环境温度：最高温度+40℃，最低温度-15℃；
相对湿度：<95%；
地震强度：8级；
安装场所：使用地无滴水、火灾、无爆炸危险、严重污秽、化学腐蚀及剧烈震动的场所。

•Altitude: no more than 2000m;
Ambient temperature: maximum temperature + 40 C, minimum temperature -1 5°C;
•Relative humidity: < 95%;
•Earthquake intensity: 8;
•Installation location: places where there is no dripping, fire, no explosion hazard, serious pollution, chemical corrosion and severe vibration.

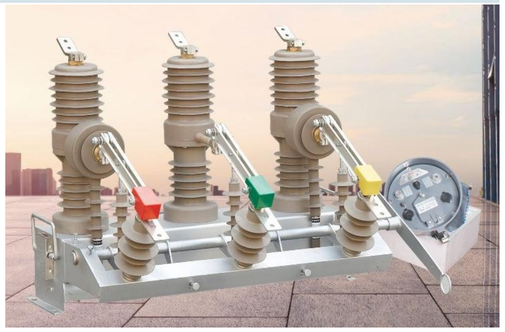
MKM65-12 / ZW32-12F

主要技术参数/Themaintechnicalparameters

项目Project		单位Unit	参数Parameter			
额定电压Ratedvoltage		kV	12			
额定频率Ratedfrequency		Hz	50			
额定绝缘水平 Rated insulation level	额定雷电冲击耐受电压峰值 Rated lightning impulse withstand voltage peak	kV	75			
	1min工频耐压Powerfrequencywithstandvoltage	kV	42			
额定电流Ratedcurrent		A	630 1250	630 1250	1250,1600 2000,2500	1600,2000,2500 3150,1000,5000
额定短路开断电流Ratedshort-circuitbreakingcurrent		kA		25	31.5	40
额定短路关合电流（峰值）Rated short circuit closing current（peak）		kA		63	80	100
额定短路持续时间Ratedshortcircuitduration		S	4			
额定操作顺序Ratedoperationsequence			O-0.3s-CO-180s-cO 0-180s-CO-180s-CO(40kA)			
额定单个背对背电容器组开断电流 Rated single/back to back capacitor bank breaking current		A	630/400			
额定短路开断电流开断次数 Rated short-circuit breaking current breaking times		次Times	30			
合闸时间Closingtime		ms	30~70			
分闸时间Openingtime		ms	20~50			
机械寿命Mechanicallife		次	10000			
额定储能和操作电压Ratedenergystorageandoperatingvoltage		V	AC220/110DC220/110			
触头开距Contactopeningdistance		mm	11±1			
触头超行距Contactoverhang		mm	3.5±0.5			
平均合闸速度Averageclosingspeed			0.5~0.8			
平均分闸速度Averageopeningspeed			0.9~1.2			
触头合闸弹跳时间Contactclosingbouncetime		ms	≤2			

ZW32-12F

Product series



产品概述/Product Overview

12kV架空配电线路T接支线路或末端用户内部发生故障时，因其进线开关保护动作时限与变电站出线开关保护时限配合无法合理整定时，将会造成变电站出线开关跳闸。如果故障性质是永久性的，变电站重合将不成功，则一个中压用户界内的局部事故将使整条12kV配电线路停电。如若在T接处或用户端（责任分界点）安装一台户外分界断路器，经过判断确认用户界内发生故障（过流、短路、单相接地等故障），自动将故障隔离，则可以确保非故障区用户正常用电。ZW32-12F户外高压智能分界真空断路器（看门狗）在12kV馈电架空线路上的应用可避免无故障线路的连带性事故停电、缩小故障停电范围、缩短用户停电时间、保护主网的安全运行。并具备故障检测功能，保护控制功能和通讯功能，可实现自动切除单相接地故障和自动隔离相间短路故障。安装点使用与12kV配电线路用户进线的责任分界点处，也可以适用于符合要求的分支线连接处。

ZW32-12F

When the 12kV overhead distribution line T is connected to the branch line or the internal user fails, the timing of the line switch protection action and the substin outlet switch protection time limit cannot be properly adjusted, which will cause the substation outlet switch to trip. If the nature of the fault is permanent and the substation coincidence will not be successful, then a local failure in a medium voitage user community will power down the entire 12kV distribution line. If an outdoor junction breaker is installed at the T junction or the customer end (responsibility demarcation point), it is ensured that the failure (overcurrent, short circuit, single phase grounding, etc.) in the user boundary is determined and the fault is automatically isolated. Users in non—fauity areas use power normally. ZW32—12F outdoor high—voltage intelligent demarcation vacum circuit breaker (watchdog) can be used on 12kV feeder ovethead line to avoid the connection of fault—free lines, thus power failure, narrowing the scope of power failure, shortening the power outage time of users, and protecting the main network. safe operation. It also has fault detection function., protection control function and communication function, which can realize automatic cut—off single—phase ground fault and automatic isolation phase—to—phase shortfault. The nstalaion point uses the responsibility demarcation point for the user incominga line of the 12kV distribution line, and can also be applied to the branch line connection that meets the requirements.

ZW32-12F 户外高压智能分界真空断路器(看门狗)

Outdoor high voltage intelligent demarcation vacuum circuit breaker (watchdog)

型号含义 / Model meaning

ZW 32 - 12 F G / □ - □

- 额定短路开断电流Ratedshort-circuitbreakingcurrent（kA）
- 额定电流Ratedcurrent（A）
- 带隔离开关Withisolationswitch
- 分界开关Demarcationswitch
- 额定电压Ratedvoltage（kV）
- 设计序号DesignNumber
- 户外真空断路器Outdoorvacuumcircuitbreaker

使用条件/Conditions of Use

海拔高度：不超过2000m；

环境温度：最高温度+40℃，最低温度-40℃；

相对湿度：在25℃时，日平均值不大于95%，月平均值不大于90%；；

风压不超过700Pa（相当于风速34m/s）

地震强度：8级；

安装场所：使用地无滴水、火灾、无爆炸危险、严重污秽、化学腐蚀及剧烈震动的场所。

ZW32-12F / ZW20-12F

Altitude: no more than 2000m;

Ambient temperature: maximum temperature + 40℃, minimum temperature -40℃;

• Relative humidity: the daily average is not more than 95%, and the monthly average is not more than 90%;

The wind pressure does not exceed 700Pa(equivalent to a wind speed of 34m/s);

Earthquake intensity: 8;

• Installation location: places where there is no dripping, fire, no explosion hazard, serious pollution, chemical corrosion and severe vibration.

主要技术参数/Themaintechnicalparameters

项目Project		单位Unit	参数Parameter	
额定电压Ratedvoltage		kV	12	
额定电流Ratedcurrent		A	630.1250	
额定频率Ratedfrequency		Hz	50	
工频耐压（1min）Power frequency withstand voltage	干式（相间、对地/断口）Dry(interphase, ground/fracture)	kV	42/48	
	湿式（对地、外绝缘）Wet(grounding, external insulation)		34	
雷电冲击耐受电流（峰值）（相间、对地/断口）Lightning impulse withstand current(peak) (interphase, ground/fracture)		kA	75/85	
额定短路开断电流Ratedshort-circuitbreakingcurrent		kA	20	25
额定短路关合电流（峰值）Rated short circuit closing current（peak）		kA	50	63
额定蜂值耐受电流Ratedbeevaluewithstandcurrent		kA	50	63
4S短时耐受电流4Sshort-timewithstandcurrent		kA	20	25
额定操作循环Ratedoperatingcycle			分-0.3s-合分-180s-合分	
额定短路电流开断次数Ratedshortcircuitcurrentbreakingtimes		次	30	
机械寿命 Mechanical life		次	10000	
二次回路1min工频耐压 Secondary circuit 1min power frequency withstand voltage		kV	2	

ZW20-12F

Product series



产品概述/Product Overview

ZW20-12F户外高压智能分界真空断路器为额定电压12kV、三相交流50Hz的户外高压开关设备。主要用于开断、关合电力系统的负载电流、过载电流及短路电流。

适用于变电站、工矿企业及城乡配电网作保护和控制，特别适用于操作频繁的场所和城网自动化配电网络。本产品与控制器配套，能满足配电自动化系统要求，并能可靠而有效地完成传统的重合器功能。它采用成熟的箱式密封结构，内部充以SF6气体，具有良好的密封性能，使之不受外界环境影响，是种免维护产品。其弹簧操动机构采用直动链条主传动和多级脱扣系统，动作可靠性高，是柱上断路器的佳品。

ZW20-12F

ZW20—12F outdoor high—voltage nelligent demarcation vacuum circuit breaker is an outdoor high—voltage switchgear with rated voltage of 12kV and three—phase AC 50Hz. It is mainly used to break and cdlose the load current, overload current and short circuit current of the power system.
Applicable to substation, industrial and mining enterprises and urban and rural distribution network for protection and control, especially suitable for places with frequent operation and urban network automation distribution network. This product is matched with the controller to meet the requirements of the distribution automation system and to perform the traditional recloser function reliably and efficiently. It adopts the mature box—type sealing structure and is fled with SF6 gas inside. It has good sealing performance and is not affected by the external environment. It is a maintenance—free product. The spring operating mechanism adopts a direct—drive chain main drive and a multi—stage tripping system, which has high operational relability and is a good subtitute for the circuit breaker on the column.

ZW20-12F 户外高压智能分界真空断路器
Outdoor high voltage intelligent demarcation vacuum circuit breaker

型号含义 / Model meaning

ZW 20 - 12 F / □ - □

- 额定短路开断电流Ratedshort-circuitbreakingcurrent
- 额定电流Ratedcurrent
- 智能型Smart
- 额定电压Ratedvoltage
- 设计序号DesignNumber
- 户外真空断路器Outdoorvacuumcircuitbreaker

使用条件/Conditions of Use

海拔高度：不超过3000m；

周围空气温度：-40℃~+40℃；日温差：日温变化25℃；

风速不大于35m/s；

●无易燃、爆炸危险、强烈化学腐蚀物（如各种酸、碱或浓烟等）各剧烈振动的场所。

•Altitude: no more than 3000m;

Ambient air temperature:-40C ~ +40C ;daily temperature difference: daily temperature change of 25C ;

• The wind speed is not more than 35m/s;

• There is no flammable, explosive hazard, strong chemical corrosion (such as various acids, alkalis, smoke, etc.) where the vibration is severe.

ZW20-12F / MKW1

主要技术参数/Themaintechnicalparameters

项目Project	单位Unit	参数Parameter
额定电压Ratedvoltage	kV	12
额定频率Rated frequency	Hz	50
额定电流Ratedcurrent	A	630、1000、1250
额定短路开断电流Ratedshort-circuitbreakingcurrent	kA	20、25
额定峰值耐受电流（峰值）Rated peak withstand current（peak）	kA	50、63
额定短时耐受电流（4s）Ratedshort-timewithstandcurrent（4s）	kA	20、25
额定短路关合电流（峰值）Rated short circuit closing current（peak）	kA	50、63
机械寿命 Mechanical life	次	10000
额定电流开断次数Ratedcurrentbreakingtimes	次	10000
额定短路武断电流武断次数 Rated short circuit breaking current arbitrary number	次	30
工频耐压（1min）：相间、对地/断口 Power frequency withstand voltage (1min) : phase, ground/fracture	kV	42、48
雷电冲击耐受电压（峰值）相间、对地断口 Lightning impulse withstand voltage (peak) phase to ground, ground/fracture	kV	75、85
二次回路1min工频耐压 Secondary circuit 1min power frequency withstand voltage	kV	2
净重Netweight	kg	140（带隔离 With isolation ≤170）

MKW1

Air circuit breaker



产品概述/Product Overview

MKW1系列智能型万能式断路器（以下简称断路器），适用于交流50Hz，额定电压至660V（690V）及以下，额定电流200A~6300A的配电网络中，用来分配电能和保护线路及电源设备免受过载、欠电压、短路、单相接地等故障的危害。断路器具有智能化保护功能，选择性保护精确，能提高供电可靠性，避免不必要的停电。同时带有开放式逼讯接口，可进行“四遥”，以满足控制中心和自动化系统的要求。断路器在海拔2000米时脉冲耐压8000V（不同海拔按标准修正，最高不超过12000V）。该断路器不带智能控制器及传感器可作隔离器用，标示为 ⎯╱⎯ ⊢✕⊣ 。
断路器符合GB14048.2《低压开关设备和控制设备低压断路器》和IEC60947-2《低压开关设备和控制设备断路器》等标准。

MKW1 series intelligent universal circuit breaker (hereinafter referred to as circuit breaker) is suitable for distribution of electric energy and protection circuit and power supply in distribution network with AC 50Hz, rated voltage up to 660V (690V) and below, rated current 200A—6300A. The equipment is protected from overload, undervoltaqe, short circuit, single phase grounding and other faults. The circuit breaker has intelligent protection function, and the selective protection is accurate, which can improve the reliability of power supply and avoid unnecessary power failure. At the same time, with an open communicationinterface, "four remote"can be carried out to meet the requirements of the control center and automation system. The circuit breaker has a pulse withstand voltage of 8000V at an altitude of 2000 meters (the altitude is corrected according to the standard, and the maximum is not more than 12000V). The circuit breaker does not have an intelligent controller and the sensor can be used as an isolator, marked as ⎯╱⎯ ⊢✕⊣ .
The circuit breaker complies with GB14048.2 "Low—voltage switchgear and control equipment low—voltage circuit breaker"and IEC60947—2 "Low—voltage switchgear and control equipment circuit breaker"and other standards.

MKW1 智能型万能式断路器
Intelligent universal circuit breaker

型号含义 / Model meaning

MK W 1 - □ / □

- 极数（四极标以4，三极时不标）Number of poles（four poles marked with 4，three poles are not marked）
- 断路器的壳架等级额定电流 Rack rated current of the circuit breaker
- 设计序号DesignNumber
- 万能式断路器 Universal circuit breaker
- 企业代号 Enterprise code

正常工作条件和安装条件/Normalworkingconditionsandinstallationconditions

周围空气温度：上限值不超过+40℃，下限值不低于-5℃，24h平均值不超过+35℃。

注：下限值为-10℃或-25℃的工作条件，用户应与本公司申明；上限值超过+40℃或下限值低于-10℃或-25C的工作条件，用户应与本公司协商。

安装地点的海拔不超过2000m。

大气条件：大气相对湿度在周围空气为+40℃时不超过50%，在较低温度下可以有较高的相对湿度，最湿月的月平均最大相对湿度为90%，同时该月的平均最低温度为+25℃，并考虑到因温度变化发生在产品表面上的凝露。超过规定要求应与本公司协商。

防护等极：IP30；

污染等级：III；

使用类别：B类

安装类别：额定工作电压660V（690V）及以下的断路器以及欠电压脱扣器，电源变压器初级线圈用于安装类别IV；辅助电路及控制电路安装类别为III.

安装条件：断路器应按本说明书要求安装，断路器的垂直倾斜度不超过5度（矿用断路器的倾斜度不超过15度）。

Ambient air temperature: the upper limit does not exceed +40 ° C, the lower limit is not lower than-5°C, and the average value of 24 h does not exceed +35 C;

Note: The lower limit is-10℃ or-25℃ working conditions, the user should declare with the company; the upper limit exceeds +40 ° C or the lower limit is lower than-10°C or-25°C working conditions, the user should The company negotiated.

The altitude of the installation site should not exceed 2000m;

•Atmospheric conditions: The relative humidity of the atmosphere does not exceed 50% when the ambient air is +40 C, and the relative humidity can be higher at lower temperatures. The monthly average maximum relative humidity of the wettest month is 90%. The average minimum temperature is +25 C, taking into account the condensation that occurs on the surface of the product due to temperature.changes. Exceeding the requirements of the regulations shall be negotiated with the company;

•Protection pole: IP30;

Pollution degree: III;

•Use category: Class B;

Installation category: circuit breakers with rated working voltages of 660V (690V) and below and undervoltage release. The primary coil of the power transformer is used to install Category IV; the auxillary circuit and control circuit are installed in category III;

•Installation conditions: The circuit breaker should be installed in accordance with the requirements of this manual. The vertical inclination of the circuit breaker should not exceed 5 degrees (the inclination of the mining circuit breaker should not exceed 15 degrees);

断路器的额定电流/Circuitbreakerratedcurrent

壳架等级额定电流 Rack rated current Inm A	额定电流 Rated current In A
2000	200 、 250 、 350 、 400 、 500 、 630 、 800 、 1000 、 1250 、 1600 、 2000
3200	2000、2500、3200
4000	3200、3600、4000
6300	4000、5000、6300

MKM1

Moulded case circuit breaker



产品概述/Product Overview

MKM1塑料外壳式断路器（以下简称断路器），是本公司采用国际先进设计、制造技术研制、开发的新型断路器之一。

其额定绝缘电压为800V，适用于交流50Hz，额定工作电压690V及以下，（GMM1-63为400V），额定工作电流至800A的电路中作不频繁转换及电动机不频繁起动之用。

断路器具有过载、短路和欠电压保护功能，能保护线路和电源设备不受损坏。

MKM1 plastic case circuit breaker (hereinafter referred to as circuit breaker) is one of the new circuit breakers developed and developed by the company using international advanced design and manufacturing technology.

ts rated insulation voltage is 800V, suitable for AC 50Hz, rated working voltage 690V and below, (GMM1 -63 is 400V), the rated working current to 800A in the circuit for infrequent conversion and motor infrequent start.

The circuit breaker has overload. short circuit and under voltage protection to protect the line and power equipment from damage.

MKM1 塑料外壳式断路器
Molded case circuit breaker

型号含义 / Model meaning

MK M1 - 125 M P / 3 3 00 2 I B 100A 安装方式

- 安装方式：板前接线；板后接线；插入式接线
  Installation method: front panel wiring; rear panel wiring; plug-in wiring
- 额定电流 Rated current
- 四极产品代号 Quadrupole product code
- 过载报警不脱扣 无：无此功能；I：过载报警不脱扣
  Overload alarm does not trip No: No such function; I: Overload alarm does not trip
- 不同用途无：配电用：2：电动机保护用；TH：三防场合用
  Different uses None: for power distribution; 2: for motor protection;
  T H: for three-proof applications
- 内部附件 Internal accessories
- 脱扣方式2：瞬时脱扣3：复式脱扣
  Tripping method 2: Instantaneous tripping 3: Duplex tripping
- 极数3：3极；4：4极 Number of poles 3: 3 poles; 4: 4 poles
- 操作方式无：本体操作；Z：转动手柄操作；P：电动操作（230V/400V）（分型I型）
  Mode of operation None: Main body operation; Z: Rotary handle operation;
  P: Electric operation (230V/400V) (I type II type)
- 分断能力等级L：标准型；M：较高型；H：高分断型
  Breaking capacity rating L: standard type; M: higher type; H: high breaking type
- 壳架等级 Shelf rating 63、125、160、225、250、400、630、800、1250
- 塑料外壳式断路器 Plastic case circuit breaker
- 企业代号 Enterprise code

说明/Description

内部附件：00：无附件；08：报警触头；10：分励脱扣器；18：分励脱扣器报警触头；20：辅助触头；28：辅助触头报警触头；30：欠压脱扣器；38：欠压脱扣器报警触头；40：分励脱扣器辅助触头；48：分励脱扣器辅助触头报警触头；50：分励脱扣器欠压脱扣器；60：双辅助触头；68：双辅助触头报警触头；70：辅助触头欠压脱扣器；78：辅助触头欠压脱扣器报警触头。
四极产品代号：A：N极不安装过电流脱扣器，且N极始终接通，不与其他三极一起合分B：N极不安装过电流脱扣器，且N极与其他三极一起合分；（N极先合后分）：C：N极安装过电流脱扣器，且N极与其他三极一起合分：（N极先合后分）；D：N极安装过电流脱扣器，且N极始终接通，不与其他三极一起合分。

Internal accessories: 00: no attachment; 08: alarm contact; 10: shunt release; 18: shunt release alarm contact; 20: auxiliary contact; 28: auxillary contact alarm contact; 30: Undervoltage release; 38: undervoltage release alarm contact; 40: shunt release auxiliary contact; 48: shunt release auxiliary contact alarm contact; 50: shunt release owed Pressure release; 60: double auxiliary contact; 68: double auxiliary contact alarm contact; 70: auxiliary contact undervoltage release; 78: auxiliary contact undervoltage release alarm contact.
Four—pole product code: A:N pole does not install overcurrent release, and N pole is always on, not combined with other three poles B:N pole does not install overcurrent release, and N pole and other three The poles are combined together; (N poles are combined first and thendivided); C: N poles are equipped with overcurrent releases, and the N poles are combined with the other three poles; (N poles are combined first and then divided); D: N poles are installed Overcurrent release, and the N pole is always on, not together with the other three poles.

执行标准/Executivestandard

本断路器产品执行下列标准
IEC60947-1及GB/T14048.1总则
IEC60947-2及GB/T14048.2低压断路器
IEC60947-4及GB/T14048.4接触器和电动机起动器
IEC60947-5.1及GB/T14048.5机电式控制电路电器

This circuit breaker product implements the following standards:
•IEC60947-1 and GB/T14048.1 General
IEC60947-2 and GB/T14048.2 low voltage circuit breakers
IEC60947-4 and GB/T14048.4 contactors and motor starters
IEC60947-5.1 and GB/T14048.5 electromechanical control circuit electrical appliances.

MKB-1000

Microcomputer protection device



产品概述/Product Overview

适用于20kV及以下电压等级的小型配电站的经济型保护测控。适用于不接地、经电阻或消弧线圈接地的小电流接地系统，针对不同的配电间隔，产品集保护、测量、监视、控制、通信、计量等多功能于一体。
根据保护对象的不同MKB1000提供多种标准配置：
MKB1000-AB/C/D/E：适用于进线、母联、出线、变压器、电容器、电动机等保护测控；
MKB1000-V：适用于电压互感器保护测控；
MKB1000-F：适用于备自投保护测控；
MKB1000-H：适用于3组电容器组保护；
ZMB1000-G：适用于4组电容器组保护；
ZMB1000-1：适用于电容器差电压保护。

It is suitable for economical protection measurement and control of small substations with voltage levels of 20kV and below. It is suitable.for small current grounding systems that are not grounded, grounded by resistors or arc suppression coils. For different power distribution intervals, the product integrates protection, measurement, monitoring, control, communication, metering and other functions into one.
The MKB1000 is available in a variety of standard configurations depending on the object being protected:
LEB1000-A/B/C/D/E: Suitable for protection measurement and control of incoming lines, bus couples, outlets, transformers, capacitors, motors,etc.;
MKB1000-V: Suitable for voltage transformer protection measurement and control;
MKB1000-F: It is suitable for self-injection protection measurement and control;
MKB1000 -H: Suitable for 3 sets of capacitor bank protection;
MKB1000 -G: Suitable for 4 groups of capacitor bank protection ;
MKB1000- 1: Suitable for capacitor differential voltage protection.

MKB-1000 微机保护装置
Microcomputer protection device

主要特点/Mainfeature

保护：MKB1000的保护功能参见《保护功能配置表》，各种保护功能的保护定值和投退可独立整定，并可显示各个保护的投退状态和动作信号。

测量的电参数包括：电流（Ia，Ib、Ic）；电压（Ua，Ub，Uc、Uab，Ubc，Uca）：频率（F）；有功功率（P）、无功功率（Q）、功率因数（PF）；有功电度（Ph）无功电度（Qh）；电流回路支持两相两元件和三相两元件的接线方式：电压回路支持星形（YM）和三角形（VN）两种接线方式根据CT，PT变比和接线方式，自动计算一次侧值和二次侧值；各测量值的精度校正通过软件实现，无需更改硬件。

●故障录波：装置具有故障录波功能，能够记录故障前后的电流、电压波形和开关量信号。模拟量的采样频率每周波24点，记录长度20个周波，并能在装置中保存最近4个故障的录波文件，可通过调试工具读取，也支持自动化监控的远程召唤。

监视：MKB1000具有完善的自检能力，发现装置工作异常将自动发出自检信号。自检内容包括：设备参数、保护定值、开入电源、AD通道、时钟芯片、存储芯片。MKB1000具有9路开关量的状态监视，可监视断路器位置、手车工作位置、接地刀位置等各种状态量。MKB1000在线监视系统的运行工况，发现异常自动发告警信号。在线监视内容包括：CT断线、PT断线等。

控制：ZMB1000支持断路器遥控功能。

事件记录：MKB1000能够记录100条带时标的事件记录，可记录各种与系统运行相关的事件，如保护动作、告警、开关变位等，时间分辨率为1ms掉电不丢失，为故障分析提供依据

人机接口：MKB1000采用高分辨率的图形液晶显示（分辨率为128x64），菜单化设计，全中文显示，各种运行信息一目了然。MKB1000具有8个LED指示灯，用于显示保护的运行状态。

通信：装置配置1个RS485通信口支持MODBUS-RTU通信规约，用于综合自动化系统的连接。

Protection: For the protection function of MKB1000, refer to the "Protection Function Configuration Table". The protection settings and the retreat of various protection functions can be independently set, and the status of the protection and the action signals of each protection can be displayed.

The measured electrical parameters include: current (Ia, Ib, Ic); voltage (Ua, Ub, Uc, Uab, Ubc, Uca); frequency (F); active power (P), reactive power (Q), power Factor (PF); active power (Ph), reactive power (Qh); current loop supports two—phase two—component ano three—phase two—component wiring; voltage loop supports star (Y M) and triangle (V N) Two kinds of wiring methods automatically calculate the primary side value and the secondary side value according to the CT, PT ratio and wiring mode; the accuracy correction of each measured value is realized by software without changing the hardware.

•Fault recording: The device has a fault recording function, which can record the current, voltage waveform and switching signal before ano after the fault. The analog sampling frequency is 24 points per week, the recording length is 20 cycles, and the recording files of the last 4 faults can be saved in the device, which can be read by the debugging tool, and also supports remote calling of automatic monitoring.

Monitoring: MKB1000 has a complete self-checking capability. It will automatically send a self-test signal when it finds that the device is.working abnormally. Se lf—test content includes: device parameters， protection settings， power—on， A/D channel, clock chip, memory chip The MKB1000 has 9-way switch status monitoring, which can monitor various status quantities such as circuit breaker position, hand truck working position, and grounding knife position. The operating conditions of the MKB1000 online monitoring system found that an abnorma automatic alarm signal was generated. Online monitoring content includes: CT disconnection, PT disconnection, and so on.

Control: MKB1000 supports the remote control function of the circuit breaker.

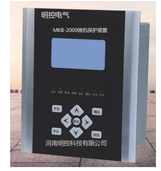
Event record:MKB1000 can record 100 event records with time stamps. It can record various events related to system operation, such as protection actions, alarms, switch displacement, etc. The time resolution is 1ms, and the power failure is not lost. Analysis provides the basis.

Human-machine interface: MKB1000 adopts high-resolution graphic liquid crystal display (resolution is 128 x 64), menu design, full Chinese display, and various operation information at a glance. The MKB10o0 has 8 LED indicators for displaying the operating status of the protection.

•Communication: The device is equipped with one RS485 communication port to support the MODBUS—RTU communication protocol for the connection of the integrated automation system.

MKB-2000

Microcomputer protection device



产品概述/Product Overview

适用于66kV及以下电压等级的小型配电站的标准型保护测控。适用于不接地、经电阻或消弧线圈接地的小电流接地系统，针对不同的配电间隔，产品集保护、测量、监视、控制、通信、计量等多功能于一体。

根据保护对象的不同MKB2000提供多种标准配置：

MKB2000-A/B/C：适用于进线、母联、出线、变压器、电容器、电动机等保护测控；

MKB2000-V：适用于电压互感器保护测控；

MKB2000-D：适用于差动保护测控；

MKB2000-S：适用于高后备保护测控。

Standard protection measurement and control for small substations of 66kV and below. It is suitable for small current grounding systems that are not grounded, grounded by resistors or arc suppression coils. For different power distribution intervals, the product integrates protection.

measurement, monitoring, control, communication, metering and other functions into one.

The MKB2000 offers a variety of standard configurations depending on the object being protected:

MKB2000-A/B/C: Suitable for protection measurement and control of incoming line, bus couple, outlet, transformer, capacitor, motor, etc.

MKB2000 -V: Suitable for voltage transformer protection measurement and control;

MKB2000-D: suitable for differential protection measurement and control;

MKB2000- S: Suitable for high backup protection measurement and control.

MKB-2000 微机保护装置
Microcomputer protection device

主要特点/Mainfeature

保护：MKB2000的保护功能参见《保护功能配置表》，各种保护功能的保护定值和投退可独立整定，并可显示各个保护的投退状态和动作信号；

测量的电参数包括：0电流（Ia，Ib，Ic）；电压（Ua、Ub.Uc，Uab，Ubc、Uca）；频率（F）；有功功率（P）、无功功率（Q）、功率因数（PF）；有功电度（Ph）、无功电度（Qh）；

电流回路支持两相两元件和三相两元件的接线方式；电压回路支持星形（YM）和三角形（VN）两种接线方式根据CT，PT变比和接线方式，自动计算一次侧值和二次侧值；

各测量值的精度校正通过软件实现，无需更改硬件；

·故障录波：装置具有故障录波功能，能够记录故障前后的电流、电压波形和开关量信号。模拟量的采样频率每周波24点，记录长度20个周波，并能在装置中保存最近4个故障的录波文件，可通过调试工具读取，也支持自动化监控的远程召唤；

监视：MKB2000具有完善的自检能力，发现装置工作异常将自动发出自检信号。自检内容包括：设备参数、保护定值、开入电源、A/D通道、时钟芯片、存储芯片。MKB2000具有14路开关量的状态监视，可监视断路器位置、手车工作位置、接地刀位置等各种状态量。MKB2000在线监视系统的运行工况，发现异常自动发告警信号。在线监视内容包括：跳合闸回路断线、CT断线、PT断线等；

控制：MKB2000支持断路器本地和远程控制功能，本地/遥控状态可通过外部开关量输入控制，配备断路器三相操作箱功能，具有交直流通用的硬件防跳、保持和闭锁功能，不受分/合闸操作电流大小的影响，适用于各种断路器的接口；

事件记录：MKB2000能够记录100条带时标的事件记录，可记录各种与系统运行相关的事件，如保护动作、告警、开关变位等，时间分辨率为1ms，掉电不丢失，为故障分析提供依据；

人机接口：MKB2000采用高分辨率的图形液晶显示（分辨率为128×64），菜单化设计，全中文显示，各种运行信息一目了然。MKB2000具有8个LED指示灯，用于显示保护的运行状态；

通信：装置配置1个RS485通信口支持MODBUS-RTU通信规约，用于综合自动化系统的连接。

Protection: For the protection function of MKB2000, refer to the "Protection Function Configuration Table". The protection settings and the retreat of various protection functions can be independently set, and the status of the protection and the action signals of each protection can be displayed;

The measured electrical parameters include: o current (Ia, Ib, Ic); voltage (Ua, Ub, Uc, Uab, Ubc, Uca); frequency (F); active power (P) reactive power (Q), Power factor (PF); active power (Ph), reactive power (Qh);

Current loop supports two-phase two-component and three-phase two-component wiring: voltage loop supports star (YMY) and delta (VM VN) wiring methods, which are automatically calculated according to CT, PT ratio and wiring method. Primary side value and secondary side value;

The accuracy correction of each measured value is implemented by software without changing the hardware.

•Fault recording: The device has a fault recording function, which can record the current, voltage waveform and switching signal before and after the fault. The analog sampling frequency is 24 points per week, the recording length is 20 cycles, and the recording files of the last 4 faults can be saved in the device, which can be read by the debuqging tool, and also supports remote calling of automatic monitoring;

Monitoring:MKB2000 has a complete self-checking capability. It will automatically send a self-test signal when it finds that the device is working abnormally. Self—test content includes: device parameters, protection settings, power—on, A/D channel, clock chip, memory chip The MKB2000 has 14—channel switching status monitoring, which can monitor various status quantities such as circuit breaker positior hand truck working position, and arounding knife position. The operating conditions of the MKB2000 online monitoring system found that an abnormal automatic alarm signal was generated. The online monitoring content includes: tripping loop disconnection, CT disconnection, PT disconnection, and the like.

Control: MKB2000 supports local and remote control functions of the circuit breaker. The localremote control status can be controlled by an external digital input. It is equipped with a three—phase operation box function of the circuit breaker. It has the functions of AC/DC genera hardware anti—jump, hold and lock. The effect of the splitclose operation current magnitude applies to the interface of various circuit breakers.

Event record: MKB2000 can record 100 event records with time stamps. It can record various events related to system operation, such as protection actions, alarms, switch displacement, etc. The time resolution is 1ms, and the power loss is not lost. Analysis provides the basis;

•Human—machine interface: MKB2000 adopts high—resolution graphic liquid crystal dispiay (with resolution of 128 x 64), menu design, ull Chinese display, and various operation information at a glance. The ZMB2000 has 8 LED indicators for displaying the operating status of the protection.

•Communication: The device is equipped with one RS485 communication port to support the MODBUS—RTU communication protocol for the.connection of the integrated automation system.

MINGKONG

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