

低压抽出式开关柜

Low voltage withdrawable switchgear

吾心求索·通享未来

得益于多年的电气产品研发和制造经验，索通电气为您提供结合了先进技术和卓越工程设计的高压开关设备；系列产品符合智能化、安全性和可靠性要求最严苛的标准。该系列能为公共配电、工业和楼宇领域提供极具成本效益的解决方案，提高竞争力。



节能型
Energy Saving



智能化
Intellectualization



易维护
Easy Maintenance



安全性
Safety

产品概述 General

GCS型低压抽出式开关柜，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400V、660V，额定电流为5000A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。

本产品符合GB7251.1-2005《低压成套开关设备和控制设备》，IEC60439-1《低压成套开关设备和控制设备》等标准的要求。

GCS type Low voltage withdrawable switchgear, is suitable for operating in distribution system of power generating plant, petroleum, chemical, metallurgy, textile, high buildings and etc where need high automation and communicated with computer, used to distribute electricity, centrally control motors, compensate reactive power in power system of three phase AC 50 (60) Hz, rated operating voltage 400V, 660V, rated current 5000A and below

Comply with GB7251.1-2005 Low voltage switchgear and controlgear, IEC60439-1 Low voltage switchgear and controlgear standard.

型号及含义 Model and meaning



正常使用条件 Normal service conditions

- 周围空气温度不高于+40°C，不低于-15°C。24小时内平均温度不得高于+35°C。超过时，需根据实际情况降容运行；
 - 户内使用，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°C时不超过50%，在较低温度时允许有较大的相对湿度，如+20°C时为90%，应考虑到由于温度的变化可能会偶然产生凝露的影响；
 - 装置安装时与垂直面的倾斜度不超过5°，且整组柜列相对平整(符合GBJ232-82标准)；
 - 装置应安装在无剧烈震动和冲击以及不足以使电器元件受到不应有腐蚀的场所；
 - 用户有特殊要求时，可以与制造厂协商解决。
- When the ambient air temperature is -15°C~+40°C, the mean value is no greater than +35°C with in 24 hours.
 - Altitude: not higher than 2000m for the installation site.
 - Relative humidity not exceed 50% at the max temperature of +40°C, higher relative humidity is allowable under lower temperature. For example, RH could be 90% at +20°C, while special measures shall be taken for the condensation occasionally produced due to temperature change.
 - The ambient air is not significantly polluted by dust, smoke, corrosive and/or flammable gases, vapours or salt.
 - Notes: If the operating conditions exceed the normal conditions, please contact our technical department.

主要技术参数
Technical specifications

■ 基本技术参数见表1 Main technical data of the switchgear 表1 Table 1

名称 Description	参数 Specifications	
主电路额定电压(V) Rated primary circuit voltage	AC400/660	
辅助电路额定电压 Rated auxiliary circuit voltage	AC220、380(400)、DC110、220	
额定频率(Hz) Rated frequency	50(60)	
额定绝缘电压(V) Rated insulation voltage	660	
额定电流(A) Rated Current	水平母线 Horizontal busbar	≤5000
	垂直母线(MCC) Vertical Busbar	1000
母线额定短时耐受电流(kA/1s) Rated short-time withstand current of busbar	50, 80	
母线额定峰值耐受电流(kA/0.1s) Rated peak withstand current of busbar	105, 176	
工频试验电压(V/1min) Rated power frequency withstand voltage(1min)	主电路 primary circuit	2500
	辅助电路 Auxiliary circuit	2000
母线 Busbar	三相四线制 Three phase four-wire	A.B.C.PEN
	三相五线制 Three phase five-wire	A.B.C.PE.N
防护等级 Degree of protection	IP30.IP40	

■ 主电路方案

GCS柜的主电路方案共32组118个规格，不包括由于辅助电路的控制与保护的变化而派生的方案和规格。包括了发电、供电和其它电力用户的需要，额定工作电流为5000A，适用2500kVA及以下的配电变压器选用。

此外，为适用供电提高功率因数的需要而设计了电容器补偿柜，考虑综合投资的需要而设计了电抗器柜。

■ 辅助电路方案

GCS辅助电路图册共有辅助电路方案120个，分上下两册。上册《交流操作部分》共分63个方案，下册《直流操作部分》共有57个方案。

直流操作部分的辅助电路方案，主要用于发电厂变电站的低压厂(所)用系统。适用于200MW及以下和300MW及以上容量机组低压厂用系统，工作(备用)电源进线，电源馈线和电动机馈线的一般控制方式。

交流操作部分的辅助方案主要用于厂矿企业及高层建筑的变电所的低压系统。有6种适用于双电源操作控制的组合方案。并设有操作电气联锁备用自投、自复等控制电路，工程设计中可以直接采用。

直流以控制电源的为直流220V或110V，交流控制电源的为交流380V或220V，由抽屉单元组成的成套柜。220V控制电源引自本柜内专设控制变压器供电的公用控制电源，公用控制电源采用不接地方式控制变压器，留有24V电源供需要使用弱电信号灯时采用。

电度表的安装地点和电压信号的引入方法及其它安装使用要求详见辅助电路图的《编制说明》。

■ 主母线

为提高母线动热稳定能力和改善接触面的温升，设备全部采用TMY-T2系列硬铜排，铜排采用全长镀锡，也可选用全长镀银铜母线。

- 水平母线、垂直母线分别安装于柜内母线隔离室内。
- 中性接地母线采用硬铜排。贯通水平中性接地线(PEN)或接地+中性线(PE+N)。

■ 电器元件选择

GCS柜主要选用技术先进性能稳定指标值高的，采用引进技术国内已能批量生产的电器元件。

- 主开关
630A及以上的电源进线及馈线开关，主选GEKW1系列，也可选用DW48系列、AE系列、3WE或ME系列，认为有必要时，也可选用进口的M系列或F系列。
- 630A以下的馈线和电动机控制开关，主要选用TG系列、GEKM1系列、NM系列、CDM系列、TG30系列等塑壳开关。
- 交流接触器，主要选用B系列、LC1系列、CJX2系列、3TB系列的接触器以及与之配套的热继电器、联锁机构。
- 电流互感器全部采用SDH系列、BH系列。
- 熔断器选用高分断能力的Q系列刀熔和NT系列。
- 为提高主电路的动稳定能力，设计了GCS系列专用的组合式母线夹和绝缘件，采用高强度、阻燃型的合成材料热塑成型，绝缘强度高，自熄性能好，结构独特。
- 为降低功能单元的间隔板、接插件、电缆头的温升，设计了NGCS柜专用的转接件，转接件容量大，温升降低。
- 如设计部门根据用户需要，选用性能更优良、技术更先进的新型电器元件时，因NGCS系列柜具有良好的通用性，不会因更新电器元件，造成制造和安装方面的困难。

■ Main circuit arrangements

GCS switchgear has total 32 groups 118 specifications of main circuit arrangements, not covering the reproduction due the change of control and protection in auxiliary circuit, meet with the demand of power generating, power supply and other electric user, its rated current up to 5000A, suitable for 2500KVA and below distribution transformers.

Moreover, we designed capacitor panel in order to improve the power factor, and reactor panel for the request of comprehensive investment

■ Schedules of auxiliary circuits

The auxiliary circuits for GCS switchgear has many schemes up to 120, divided into Volume 1 and 2. Volume 1 "AC operating part", total 63 schemes, volume 2 "DC operating parts" total 57 schemes.

The auxiliary circuit scheme of "DC operating parts" is mainly used in the low voltage system in power generating plant or substation, suitable for such substation or plant with 200MW and below, and 300MW and above generator set, used as work (standby) power incoming line, the common control mode of input feeder and motor feeder.

The auxiliary circuit scheme of "AC operating parts" is mainly used in the low voltage system of substation in mineral enterprise or high buildings. There have six kinds suitable for combination plan of twin power supply control. Such control functions of electric interlock, standby auto switch-on, auto-reset and etc is prepared, which can be utilized directly during design.

DC operating source is DC220V or 110V, AC source is AC380V or 220V, this switchgear composed of withdrawable unit units. 220V source come from the public control source: control transformer of this switchgear, this source uses such control transformer without earthing, 24V power output is prepared for future where it may need.

For mounting place of energy meter, voltage signal input mode, their installation and operation methods, please read "Description of Auxiliary Circuit Diagram" in details

■ Main busbar

In order to increase the thermal and dynamic steady capacity and improve temperature rise on the connection point, the switchgear adopt TMY-T2 series hard electrolytic copper busbar with tin coating completely, silver coating is available as required.

- a. Horizontal busbar, vertical busbar assembled in busbar compartment respectively.
- b. Neutral earthing busbar is hard copper busbar, passing through horizontal neutral earthing line (PEN) or earthing +neutral line (PE+N)

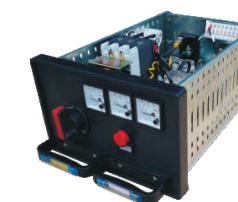
■ Selection of electric components

The inner apparatus of GCS switch mainly selects such components with high performances or those produced by use of latest foreign technology:

- a. Main switch
Main circuit breaker of 630A and above for power input and feeders, mainly use GEKW1 series, DW48 series, AE series, 3WE or ME series, also foreign M series or E series is available.
- b. Circuit breaker of 630A and below for feeders or motor control, mainly chooses TG, GEKM1, NM, CDM, TG30 series MCCB.
- c. AC contactor mainly adopted B、LC1, CJX2, 3TB series, and the cooperated thermal relay, interlock device.
- d. Current transformer may be SDH, BH series.
- e. Fuses to be high interrupting capacity Q or NT series
- f. In order to improve the dynamic steady capacity for the main circuit, the combined busbar clamp and insulated support are designed especially for GCS switchgear, made of high strength, high insulation, and flameproof compound thermoplastic material.
- g. To decrease the temperature rise of separate plate, plug and insert, cable connector, the special transition pieces are designed for GCS switchgear, with high carrying ability.
- h. If the designer will choose new electric apparatus or components required by user, GCS switchgear has good compatibility, the new product will not give trouble to assembly.



1单元抽屉
Withdrawable units size 1



1/2单元抽屉
Withdrawable units size 1/2

■ 功能单元

- a. 抽屉层高的模数为160mm。分为1/2单元、1单元、1½单元、2单元、3单元五个尺寸系列。单元回路额定电流630A及以下。
- b. 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。
- c. 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。
- d. 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接插件。
- e. 抽屉面板具有分、合、试验、抽出等位置的明显标志。
- 抽屉单元设有机械联锁装置。确保操作安全。
- 馈线柜和电动机控制柜设有专用的电缆隔室，既提高了电缆的使用可靠性，又极大地方便了用户对电缆的安装与维修。电缆隔室有二个宽度尺寸(240mm和440mm)可供选用或柜后出线(不占柜宽度)，视电缆数量、截面和用户对安装维修方便的要求而定。
- 考虑到干式变压器使用的普通性安全性和油浸变压器的经济性，该设备既可以方便地与干式变压器组成一个组列，也可以与油浸变压器低压母线方便连接。
- 以抽屉为主体，同时具有抽出式和固定式，可以混合组合，任意选用。
- 设备按三相五线制和三相四线制设计，设计部门和用户可以方便地选用PE+N和PEN方式。
- 柜体的防护等级为IP30、IP40，可能按用户需要选用。

■ Function unit

- a. The layer height (module) of withdrawable unit: 160mm, divided into 1/2 unit, 1 unit, 1 1/2 unit, 2unit, 3 unit, total five sizes. Rated current of each unit loop is 630A and below.
- b. The change of withdrawable unit only correspond to its height, width and depth unchanged. The withdrawable units with same function can be interchangeable.
- c. Each MCC switchgear can install 11 withdrawable units with 1-unit height, or 22 withdrawable units with 1/2 unit height. The withdrawable unit with height more than 1 unit adopts multifunctional back plate.
- d. The incoming and outgoing line composed of different quantity of same plate-shaped connectors according to current rating.
- e. withdrawable unit panel has the marks of OFF, ON, TEST, DRAW-OUT position and etc
- withdrawable unit unit provided with mechanical interlock to ensure the safety of operator.
- The outgoing (feeder) switchgear and motor controlled switchgear provide the special cable compartment, which can increase the reliability of cable operation, and make user install and maintain the cable very easy. This compartment has two width sizes (240mm and 440mm) for choice, or outgoing from switchgear back (not occupied the width of switchgear), please determine it according to cable number, cross sectional area and user requirement for installation and maintenance.
- In consideration of the safety of dry type transformer and the economy of oil-immersed transformer, this switchgear can connect with dry type transformer in row, may also connected with low voltage busbar of oil immersed type transformer.
- withdrawable units are main units, some fixed type are mixed, free combination.
- The switchgear designed as 3-phase 5-wire and 3-phase 4-wire system, the designer and user can select PE+N or PEN system accordingly.
- Protection grade of this switchgear: IP30, IP40, as required by user.

结构特点
Structural characteristics

- 设备的主构架采用8MF型钢或C型钢，构架采用拼装和部分焊接两种结构形式。主构架上均有安装模数孔 E=20mm。
- 设备各功能室严格分开，其隔室主要分为功能单元室、母线室、电缆室、各单元的功能相对独立。
- GCS柜体的尺寸系列如表2。
- The main frame of switchgear adopts 8MF type steel or C type steel, assembly and welding are combined. The frame provide lots of mounting holes (E=20mm) for modules
- Each compartment in the switchgear will be separated strictly and independent relatively, mainly divided into: function unit compartment, busbar compartment, and cable compartment.
- Dimension of GCS switchgear as table 2.

表2 Table 2

高 Height	2200			
宽 Width	400	600	800	1000
深 Depth	800 1000	800 1000	600 800 1000	600 800 1000

安装与使用
Installation and Operation

产品到达收货地点后，首先应当检查包装是否完整无损，发现问题应及时通知合同有关部门做好商务记录，共同分析原因，作好签证和善后处理。

对于不立即安装的产品，应根据正常使用条件和电气设备暂时保管规程要求置于适当的场所，妥善保管。

- 产品的安装应按安装示意图进行(见图1、表4)。基础槽钢和采用螺栓固定方式时的螺栓由用户自备。母线连接时，如表面因运输、保管等原因有不平时需平整后再连接紧固。
- 设备单独或成列安装时，其垂直度以及柜面不平度和柜间缝隙的偏差应符合表3规定。

After the products have arrive at delivery destination, firstly check the package is good or not, if broken or bad, please notify our related department for recording on time, analyze the reason and perform and proper treatment.

For those products not to be installed in time, please store the products in proper warehouse under the ambient conditions specified in the corresponding standards for electric equipment.

- The installation shall be executed according to the illustration Figure1. Channel steel and bolts for foundation shall be provided by user. If the surface of main busbar is not flat because of transportation or storage or other reason, please make it flat, then perform connecting busbar.
- When the switchgears mounted in a row, vertical degree, switchgear flatness, deviation of gap between neighboring panels shall comply with the data specified in table 3.

表3 Table 3

项次 No.	项目 Item	允差(mm) Tolerance
1	垂直度 Vertical	3.3
2	水平度 Horizontality	相邻两柜顶部 Top of two adjacent switchgears
		成列柜顶部 Top of switchgears in row
3	不平度 Roughness	相邻两柜边 The edge of two adjacent switchgears
		成列柜边 The edges of switchgears in row
4	柜间接缝 Gap between adjacent switchgears	2

■ **产品安装后投运前的检查与试验**

- a. 检查柜面漆或其它覆盖材料(如喷塑)有否损坏，柜内是否干燥清洁。
- b. 电器元件的操作机构是否灵活，不应有卡滞或操作力过大现象。
- c. 主要电器的通断是否可靠、准确。
- d. 抽屉或抽出式机构抽拉应当灵活、轻便、无卡阻和碰撞现象。
- e. 抽屉或抽出式结构的动、静触头的中心线应一致，触头接触应紧。主、辅触头的插入深度应符合要求。机械联锁或电气联锁装置应动作正确，闭锁或解除均应可靠。
- f. 一次方案、二次原理及抽屉尺寸完全相同的抽屉应能方便的互换，无卡阻和碰撞现象。
- g. 更换熔断器的熔芯时，应符合工程设计的要求。
- h. 保护的整定值应根据实际负荷进行正确的整定。
- i. 用1000V兆欧表测量绝缘电阻值不得低于10MΩ。
- j. 各母线的连接应良好，绝缘支撑件，安装件及其它附件安装应牢固可靠。

■ **使用注意事项**

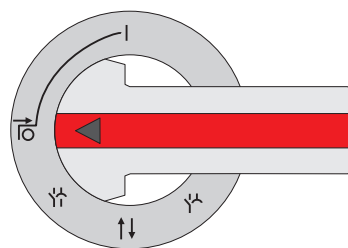
- a. 设备为不靠墙安装，正面操作，双面维护的低压配电柜。柜的维修通道及柜门，必须由考核合格的专业人员方可进入或开启进行操作、检查和维修。
- b. 空气断路器、塑壳断路器经过多次分、合，特别是经过短路分、合后，会使触头局部烧伤和产生碳类物质，使接触电阻增大，应按断路器使用说明书进行维护和检修。
- c. 经过安装和维护后，必须严格检查各隔室之间、功能单元之间的隔离状况，以确保本装置良好的功能分隔性，防止出现故障扩大。

■ **Check and test before put into operation**

- a. Check the painting or other coating (such as sprayed plastic) on surface of switchgear is damaged or not, switchgear inside is dry and clean or not, screws and fixings are loose or not.
- b. The operation mechanism of electric apparatus shall be smooth and agile, not blocked, or the operating force shall not be too large.
- c. The opening and closing of main switches is reliable and correct or not.
- d. withdrawable unit or draw-out mechanism shall be smoothly lightly pushed in or pulled out, without being blocked or knocked.
- e. The center of moving and static contacts in withdrawable unit or draw-out part shall be in a line, and the contacts shall be firmly touched. The inserted depth of main and auxiliary contacts shall meet with the requirement. The mechanical or electric interlock shall take action correctly, locking or unlocking shall be reliable.
- f. The withdrawable units with same primary and secondary diagram and sizes shall be interchangeable, operated without block and knock as well.
- g. When to replace fuse element, please follow the instruction for the fuses.
- h. The protective setting value shall be calibrated according to actual conditions
- i. Use 1000V Megger to measure the insulation resistance, not less than 10MΩ
- j. The busbar connections shall be solidly reliably contacted, and supported by insulator, other accessories shall be installed firmly.

■ **Notices for operation**

- a. The switchgear can't be mounted closed with wall, as operated in front, maintained from two sides, the maintenance, inspection and repair shall be performed only by the qualified and trained personnel.
- b. After air circuit breaker, moulded case circuit breaker has opened many times of loading current, especially broken the short circuit current several times, the contacts will be burnt partially and produce carbonized medium, make contacting resistance increase, please perform the maintenance and repair according to the related manual.
- c. After to be installed and maintained, please check the isolation status between each compartment, function unit and etc, to ensure the good isolation feature, and avoid the possible fault being expanded.



1/2单元抽屉的操作示意图
Illustration of operating
withdrawable unit size 1/2

■ 抽屉的操作

a. 1/2抽屉的操作

该抽屉的操作机构由转动部分，转轴、锁扣等组成，具有开关的分合、试验、隔离及锁定功能。

操作机构还装有微动开关作为电气闭锁之用。

- | 工作位置：主开关合闸，主回路及控制回路均接通，功能单元锁定。
- 分闸位置：主开关分闸，控制回路接通，功能单元锁定。
- ⚡ 试验位置：主开关分闸，主回路断开，控制回路接通，功能单元锁定。
- ⚡ 隔离位置：抽屉抽出30mm。主、控制回路均隔离断开，抽屉锁定。
- ↑↓ 抽出位置：主回路和控制回路均断开，抽屉任意抽出。

⚡ 操作手柄往里压下6mm后，方能从(○)位置转向(|)位置。

工作过程：在抽出位置(↑↓)时，抽屉方能推进或拉出，逆时针转动45°后，拉出抽屉时可自动到达隔离位置(⚡)。顺时针转动45°，到达试验位置(⚡)。再顺时针转动45°，到达开关分断位置(○)。将手柄往里压下6mm顺时针转动90°后，开关合闸，如需退出，则依次相反操作。

如有必要，操作手柄上可在主开关分闸、试验、隔离三位置加挂锁，作为安全保护。

■ Operation of the withdrawable unit

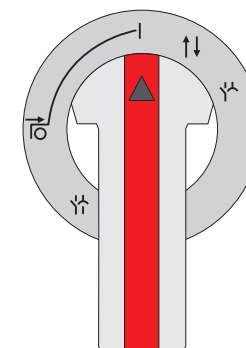
a. Operation of the 1/2 unit withdrawable unit

The operating mechanism of this withdrawable unit consists of rotation part, shaft, buckle and etc, has such function of opening/closing switch, test, isolate and locked. Also micro switch is installed for electric interlock.

- | ON position: main switch closed, main circuit and auxiliary circuit closed, function unit is locked.
- OFF position: main switch opened, auxiliary circuit closed, function unit is locked.
- ⚡ TEST position: main switch opened, main circuit opened, auxiliary circuit closed, function unit is locked
- ↑↓ DRAW-OUT position: main circuit and auxiliary circuits opened, withdrawable units can be pulled out or pushed in.
- ⚡ ISOLATED position: withdrawable unit pulled out 30mm, main circuit and auxiliary circuits isolated and opened, withdrawable unit is locked.
- ⚡ Only after operating handle is pushed inside, then it can transfer "○" position to "|" position.

Operation procedure: when withdrawable unit at DRAW-OUT "↑↓" position, it can be pushed in or pulled out, if withdrawable unit pushed in already, rotate handle 45° in counterclockwise direction, pull withdrawable unit out 30mm, reach ISOLATED "⚡" position. when withdrawable unit at DRAW-OUT "↑↓" position, after withdrawable unit pushed in, rotate handle 45° in clockwise direction to "⚡" TEST position, rotate 45° again in clockwise direction, make main switch transfer to OFF "○" position, push handle down 6mm, then rotate 90° in clockwise direction, the switch closed, if it need exit, operate it through inverse procedure

If necessary, operating handle can be locked with padlock when main switch is in OFF, TEST, ISOLATED position.



1单元及以上抽屉的操作示意图
Operation of the withdrawable
unit size 1 and above

b. 1单元及以上抽屉的操作

该抽屉的操作机构由转轴、圆柱形凸轮、离合齿片、轴销压簧、拨叉等组成。通过操作手柄转动圆柱形凸轮可插拔抽屉并同时具备开关的分、合、试验、隔离及锁定功能。

- | 工作位置：主开关合闸，主回路及控制回路均接通，功能单元锁定。
- 分闸位置：主开关分闸，控制回路接通，功能单元锁定。
- ⚡ 试验位置：主开关分闸，主回路断开，控制回路接通，功能单元锁定。
- ⚡ 隔离位置：抽屉抽出30mm。主、控制回路均隔离断开，抽屉锁定。
- ↑↓ 抽出位置：主回路和控制回路均断开，抽屉任意抽出。
- ⚡ 操作手柄往里压下9mm后，方能从(○)位置转向(|)位置。

工作过程：在抽出位置(↑↓)时，抽屉方能旋进或旋出，操作手柄顺时针转动30°后，到达隔离位置(⚡)，再顺时针转动180°，到达试验位置(⚡)，继续顺时针转动30°后，到达开关分断位置(○)，将手柄往里压下9mm顺时针转动90°后，主开关合闸，如需退出，则依次相反操作。

如有必要，操作手柄上可在主开关分闸、试验、隔离三位置加挂锁，作为安全保护。

■ 解锁机构

在1单元及以上抽屉的右下角有一个红色的塑料按钮，这是解锁机构，当操作机构故障、维修或需要打开时将操作手柄在“○”位时，把红色塑料按钮往下按即可开门。

b. Operation of the withdrawable unit size 1 and above

- | The operating mechanism of this withdrawable unit consists of rotation shaft, cylindrical cam, clutch gear, compressed spring of axle pin, fork and etc. rotate cylindrical cam to push in or pull out the withdrawable unit, meanwhile with the function of closing, opening, testing, isolating and locking the switch.
- ON position: main switch closed, main circuit and auxiliary circuit closed, function unit is locked.
- ⚡ OFF position: main switch opened, auxiliary circuit closed, function unit is locked.
- ⚡ TEST position: main switch opened, main circuit opened, auxiliary circuit closed, function unit is locked
- ↑↓ ISOLATED position: withdrawable unit pulled out 30mm, main circuit and auxiliary circuits isolated and opened, withdrawable unit is locked.
- ⚡ DRAW-OUT position: main circuit and auxiliary circuits opened, withdrawable units can be pulled out freely.

Only after operating handle is pushed 9mm inside, then it can transfer "○" position to "|" position.

Operation procedure: when withdrawable unit at DRAW-OUT "↑↓" position, it can be screwed in or out, rotate handle 30° in clockwise direction, reach ISOLATED "⚡" position, rotate handle 180° again in clockwise direction to "⚡" TEST position, rotate 30° again in clockwise direction, make main switch transfer to OFF "○" position, push handle down 9mm, then rotate 90° in clockwise direction, the switch closed, if it need exit, operate it through inverse procedure

If necessary, operating handle can be locked with padlock when main switch is in OFF, TEST, ISOLATED position.

■ Unlock device

The withdrawable unit size 1 or above unit height, has red plastic pushbutton at the right corner of bottom, this is unlock device, if operating mechanism has fault, under repair, or it need open, while handle is at "○" position, push this red button to open the door.

外形及安装尺寸
Dimensions

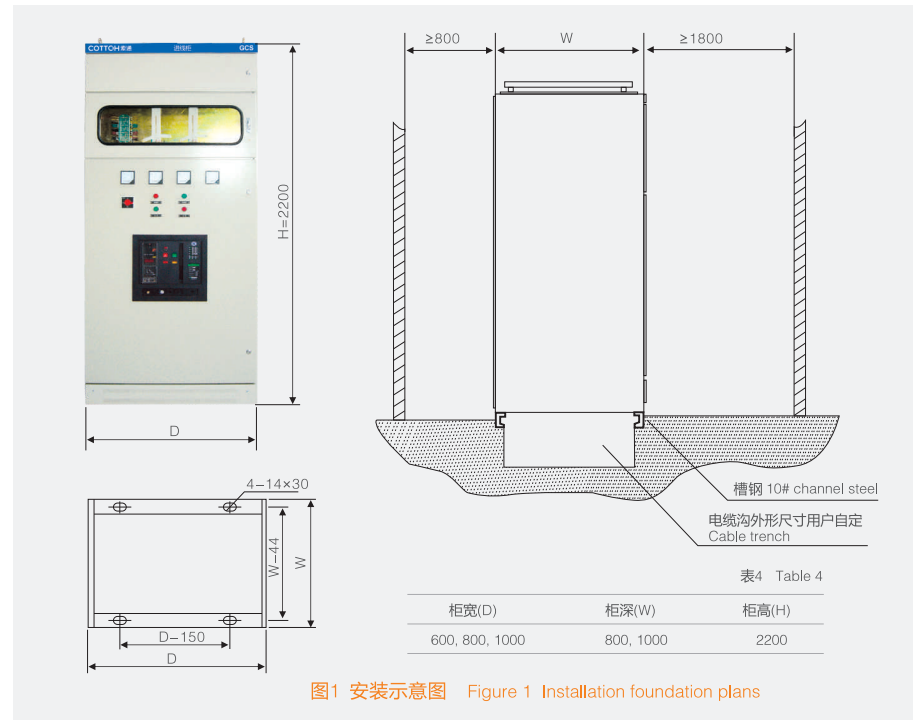


图1 安装示意图 Figure 1 Installation foundation plans

出厂资料及附件
Delivery technical data and accessories

制造厂供货时应提供下列文件及附件

- 发货清单
- 产品合格证及出厂试验报告
- 使用说明书
- 有关电气图纸
- 主要元件说明书
- 柜门钥匙，操作手柄及合同单规定的备品备件。

While to deliver the goods, the manufacturer will provide the following documents and accessories

- Packing list
- Qualification certificate and routine test report
- Operation manual
- Electric drawings
- Manual for main components
- Keys for switchgear doors, operating handle and spare parts specified in contract.

订货须知
Ordering Information

订货时应提供下列技术资料：

- 主接线方案编号、用途和单线系统图、额定电压、额定电流，额定短路开断电流、配电室平面布置图及开关柜的排列配置图等；
- 开关柜控制、测量及保护功能的要求以及其它闭锁和自动装置的要求及原理图；
- 开关柜内主要电气元件的型号，规格及数量；
- 开关柜用在特殊环境条件时，应在订货时详细说明
- 其它特殊要求，在订货前须详细书面说明、协商。

Please provide the following documents when to book the product:

- Primary circuit scheme number, usage, single line diagram, rated voltage, rated current, rated short circuit breaking current, installation room layout and switchgear layout and etc.
- The requirement for control, measure, and protection of switchgear, interlocks and automatic devices, working theory and etc.
- Main components, model, specification and quantity for switchgear
- When the switchgear will be used in the special ambient conditions, please indicate when to book the product
- For other special requirements, please indicate in writing for discussing.

一次线路方案 Typical primary schemes

方案号 No.	01	02	03	04
单线图 Primary circuit scheme				
用途 Application	受电(上进线) Receiving(Upper incoming)	受电(下侧进线) Receiving(Lower incoming)	受电(电缆进线) Receiving(Cable incoming)	联络 Communicating
规格序号 Type No.	A B C D E F G	A B C D E F G	A B C D E	A B C D E F G
短时耐受电流/瞬时耐受电流(kA) Short-time withstand current Peak withstand current	80/176	80/176	80/176	80/176
额定电流(A) Rated current	4000 3150 2500 2000 1600 1000 630	4000 3150 2500 2000 1600 1000 630	2500 2000 1600 1000 630	4000 3150 2500 2000 1600 1000 630
GEKW1-4000	1	1	1	1
GEKW1-3200	1	1	1	1
GEKW1-2500	1	1	1	1
GEKW1-2000A	1	1	1	1
GEKW1-1600	1	1	1	1
GEKW1-1000	1	1	1	1
GEKW1-630	1	1	1	1
SDL-□	(1)	(1)	(1)	(1)
LMK-□□/5	(3/4)	(3/4)	(3/4)	(3/4)
柜宽(mm) Panel width	1000 800 600	1000 800 600	800 600	1000 800
柜深(mm) Panel depth	1000 800	1000 800	800	800
占用小室高度 Panel height				

方案号 No.	05	06	07	08
单线图 Primary circuit scheme				
用途 Application	母线转换 Bus Converter	馈电 Feeding	双电源手动切换 Dual power manual switch	双电源手动切换 Dual power manual switch
规格序号 Type No.		A B C	A B	A B
短时耐受电流/瞬时耐受电流(kA) Short-time withstand current Peak withstand current		50/105 30/63	50/105 30/63	50/105 30/63
额定电流(A) Rated current		1600 1000 630	1000 630	1000 630
GEKW1-1600		1		
GEKW1-1000		1	1	1
GEKW1-630		1	1	1
GLZ-1000			1	1
GLZ-630			1	1
SDL-□		(1) (1) (1)		
LMK-□□/5		1(3) 1(3) 1(3)	(3/4) (3/4)	(3/4) (3/4)
柜宽(mm) Panel width	400(600)	800	800	800
柜深(mm) Panel depth	800(1000)	800(1000)	800	800
占用小室高度 Panel height		640		

备注：1. GEKW1是主选断路器，也可选用其它断路器，如F、M、CW1、NA系列断路器。

2. 01、02、04方案如PE+N线需进入电源柜时柜宽用括号内尺寸。

Note: 1. GEKW1 is the first chosen breaker, other model is optional such as F, M, CW1, NA series breakers.

2. For 01、02、04 schemes, if PE+N line need enter into power input switchgear, the actual switchgear width is the data in the bracket.

方案号 No.	09				10				11			12	
单线图 Primary circuit scheme													
用途 Application	双电源切线 Dual Power tangent				馈电 Feeding				馈电 Feeding			限流电抗器 Current-limiting reactor	
规格序号 Type No.	A	B			A	B	C	D	A	B	C		D
短时耐受电流/瞬时耐受电流(kA) Short-time withstand current Peak withstand current	50/105 30/63 400 250				50/105 30/63 630 400 250 160				50/105 30/63 400 200 100			600	
额定电流(A) Rated current					1								
QSA-630					1								
QSA-400						1							
QSA-250							1						
QSA-160													3
限流电抗器600A0.0084Ω/f1													
B370,LC1,CJX2	1												
B250,LC1,CJX2		1											
TG-400BD,GEKM1-400L,TM30	1	1							1				
TG-225BD,GEKM1-225L,TM30		1								1			
TG-100BD,GEKM1-100L,TM30											1		
SDL-□					(1)	(1)	(1)	(1)	(1)	(1)	(1)		
SDH-□□/5					1(3)	1(3)	1(3)	1(3)	1(3)	1	1		
柜宽(mm) Panel width	800(1000)				800(1000)				800(1000)			600	
柜深(mm) Panel depth	800				800(1000)				800			800	
占用小室高度 Panel height	480×2				480	320			240(160)				

方案号 No.	13		14		15	
单线图 Primary circuit scheme						
用途 Application	电压互感器 Voltage transformer		电压互感器 Voltage transformer		电压互感器 Voltage transformer	
规格序号 Type No.						
额定电流(A) Rated current						
QSA-63			1		1	
NT00-□	3					
JDG-0.5 380/100	2		2		3	
SDH-□□/5						
柜宽(mm) Panel width	(不占间隔, 装在受电柜内或05方案转柜内, 接在分支母线上)		(不占间隔, 装在受电柜内或05方案转柜内, 接在分支母线上)		(不占间隔, 装在受电柜内或05方案转柜内, 接在分支母线上)	
柜深(mm) Panel depth						
占用小室高度 Panel height						

备注: 馈线方案可以加装零序保护、零序电流互感器装入电缆隔室。

方案号 No.	16			17		18		19		
单线图 Primary circuit scheme										
用途 Application	电动机(不可逆) Motor (irreversible)			电动机(不可逆) Motor (irreversible)		电动机(不可逆) Motor (irreversible)		电动机(可逆) Motor (irreversible)		
规格序号 Type No.	A	B	C	A	B		D	A	B	C
最大控制电机功率 Max. control motor power	100	75	75	37	15		7.5	100	75	75
QSA-250	1							1		
QSA-160		1							1	
QSA-125			1	1						1
HH17-63					1					
NT00-□							3			
B250,LC1,CJ20	1								2	
B170-105,LC1,CJ20		1	1						2	2
B85或LC1-D80				1						
B45或LC1-D32					1					
B16或LC1-D18							1			
T85,LR1				1						
TSA45,LR1					1					
T16,LR1	1	1	1				1	1	1	1
SDL-□	(1)	(1)	(1)		(1)		(1)	(1)	(1)	(1)
SDH-□□/5	3	3	3	1	1		1	3	3	3
占用小室高度 Panel height	320			240		160		480		

方案号 No.	20		21		22			23		
单线图 Primary circuit scheme										
用途 Application	电动机(可逆) Motor (reversible)		电动机(可逆) Motor (reversible)		电动机(可逆) Motor (reversible)			电动机(不可逆) Motor (irreversible)		
规格序号 Type No.	A	B		D	A	B	C	A	B	C
最大控制电机功率 Max. control motor power	37	15		7.5	100	75	75	37	15	7.5
QSA-125	1									
HH17-63		1								
NT00-□				3						
GEKM1-400L,TG-400BD,TM30					1					
GEKM1-225M,TM30						1	1			
GEKM1-100M,TG-100BD,TM30								1	1	1
B250,LC1,CL20					1					
B170,05,LC1,CJ20						1	1			
B85或LC1-D80	2							1		
B45或LC1-D32		2				2			1	
B16或LC1-D18										1
T85,LR1	1							1		
TSA45,LR1		1							1	
T16,LR1				1		1	1			1
SDL-□	(1)	(1)		(1)	(1)	(1)	(1)	(1)	(1)	
SDH-□□/5	1	1		1	3	3	3	1	1	
占用小室高度 Panel height	240		160		480			320		

方案号 No.	24			25			26			27			
单线图 Primary circuit scheme													
用途 Application	电动机(可逆) Motor (reversible)			电动机(可逆) Motor (reversible)									
规格序号 Type No.	A	B	C	A	B	C							
短时耐受电流/瞬时耐受电流(kA) Short-time withstand current Peak withstand current	50/105 30/63			50/105 30/63									
最大控制功率(kW) Max. control motor power	100	75	55	37	15	7.5							
主回路电器设备选择 Main components	GEKM1-400M,TG-400BD,TM30	1											
	GEKM1-225M, TM30	1											
	GEKM1-100M,TG-100BD,TM30		1		1	1	1						
	B250,LC1,CJ20	2											
	B170~105,LC1,CJ20	2	2										
	B85或LC1-D80				2								
	B45或LC1-D32				2								
	B16或LC1-D18					2							
	T85,LR1				1								
	TSA45,LR1					1							
	T16,LR1	1	1	1			1						
	SDH-□	(1)	(1)	(1)	(1)	(1)	(1)						
	SDH-□□/5	3	3	3	1	1	1						
柜宽(mm)	800(1000)			800(1000) <small>800/2 1000/2</small>									
柜深(mm)	800			800									
占用小室高度	480	320		240	160								

方案号 No.	28												
单线图 Primary circuit scheme													
用途 Application	电动机(不可逆) Motor (irreversible)												
规格序号 Type No.	A	B	C										
短时耐受电流/瞬时耐受电流(kA) Short-time withstand current Peak withstand current	50/105 50/105												
最大控制功率(kW) Max. control motor power	200	160											
主回路电器设备选择 Main components	NT3-□	3	3										
	GEKM1-600M,TG-600BD,TM30	1											
	GEKM1-400M,TG-400BD,TM30	1											
	B370,LC1,CJ20	1	1										
	T16,LR1	1	1										
	LJ-□	(1)	(1)										
	SDH-□□/5	3	3										
	柜宽(mm)	1000											
	柜深(mm)	800(1000)											
	占用小室高度	800											

方案号 No.	30			31			32			33		
单线图 Primary circuit scheme												
用途 Application	Y-Δ启动 Start			Y-Δ启动 Start			Y-Δ启动 Start			Y-Δ启动 Start		
规格序号 Type No.	A	B	C	A	B	C	A	B	C	A	B	C
短时耐受电流 Short-time withstand current	50/105			50/105			50/105			50/105		
瞬时耐受电流(kA) Peak withstand current	30/63			30/63			30/63			30/63		
最大控制功率(kW) Max. control motor power	30	90		37	15		160	90		15		
主回路电器设备选择 Main components	QSA-400-250						1	1				
	QSA-125									1		
	HH17-63										1	
	NT3-□	3	3									
	TG-400BD, TM30	1										
	GEKM1-225M,TG-225BD, TM30	1										
	GEKM1-100M,TG-100BD, TM30				1	1						
	B370+B250,LC1,CJ20	2+1								2+1		
	B250+B170,LC1,CJ20	2+1								2+1		
	B85或LC1-D80				3							3
	B45或LC1-D32					3						3
	T85,LR1				1							
	TSA45,LR1					1						1
T16,LR1	1	1							1	1		
SDH-□	(1)	(1)		(1)	(1)		(1)	(1)		(1)	(1)	
SDH-□□/5	3	3		1	1		3	3		1	1	
柜宽(mm) Panel width	1000			800(1000)			1000			800(1000)		
柜深(mm) Panel depth	800(1000)			800			800(1000)			800		
占用小室高度 Panel height	1120	960		320			800			320		

方案号 No.	34			35			36			37			
单线图 Primary circuit scheme													
用途 Application	无功补偿(主柜) Reactive power compensation (main panel)			无功补偿(辅柜) Reactive power compensation (Auxiliary panel)			公共电源 Common power						
规格序号 Type No.	A	B	C	A	B	C							
最大补偿量(KVAR) Max. compensation capacity	160	128	96	160	128	96							
主回路电器设备选择 Main components	QA-400	1	1	1	1	1							
	am-32	30	24	18	30	24	18						
	QSA-125								3				
	NT00-□								1				
	JBK3-400												
	CJ19	10	8	6	10	8	6						
	T45,LR1, JR36	10	8	6	10	8	6						
	BCMJ-0.4-16-3	10	8	6	10	8	6						
	SDH-□□/5	3	3	3	3	3	3						
	柜宽(mm) Panel width	1000	800		1000	800							
柜深(mm) Panel depth	800			800									
占用小室高度 Panel height													