

RGCS

Type low-voltage switchboards of
the draw-out version

**概 述**

RGCS 型低压抽出式开关柜（以下简称装置）是两部联合设计组根据行业主管部门、广大电力用户及设计单位的要求设计研制出的符合国情、具有较高技术性能指标、能够适应电力市场发展需要并可与现有引进产品竞争的低压抽出式开关柜。该装置目前已被电力用户广泛选用。

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(400)、(660)，额定电流为 4000A 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。装置的基本组织形式见附图 1。

装置的设计符合下列标准

IEC439-1 《低压成套开关和控制设备》

GB7251 《低压成套开关设备》

JB/T9661 《低压抽出式成套开关设备》

Brief Introduction

RGCS Type low-voltage switchboards of the draw-out version (abbreviated as device in the following parts) is studied and produced by two joint designing groups according to the requirements of the professional administration, the common electricity users, and the designing unit. It meets the conditions of our country, has high technical performance index, can apply to the developing need of the electricity market and can compete with the currently introduced products. This device is now widely used by the electricity users. This device applies to the electricity distribution system for the professions of power plants, oil, and chemical industry, metallurgy, textile and high-rise construction etc. In the places such as huge power plants, petrochemical industry system etc. which are highly automatic and should be interfaced to computers, it functions as the electricity distribution, the collective control of the motor and the low-voltage complete set of electricity distribution device, which is used for reactive-load compensation, in the electricity generation and supply systems whose triphase AC frequency is 50(60)Hz, whose rated working voltage is 380V(400),(600) and whose rated current is less equal to 4000A. The basic organizing pattern of the device is showed in the attached picture

The design of the device meets the following criteria. IEC439-1 low-voltage complete set of switch and controlling equipment

GB7251 《low-voltage complete set of switch equipment》

JB/T9661 《low-voltage draw-out complete set of switch equipment》

使用条件

2.1 周围空气温度不高于 +40 °C，不低于 -5 °C。2.4 小时内平均温度不得高于 +3.5 °C。超过时，需根据实际情况降容运行。

2.2 户内使用，使用地点的海拔高度不得超过 2000m。

2.3 周围空气相对湿度在最高温度为 +40 °C 时不超过 50%，在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。

2.4 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）。

2.5 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。

2.6 用户有特殊要求时，可以与制造厂协商解决。

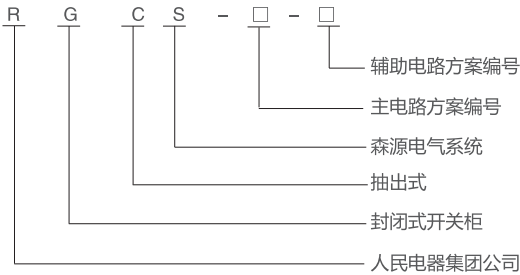
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Using conditions

- 2.1 The surrounding temperature must be less equal to +40℃ and over equal to -5℃ . The average temperature within 24hours must be less equal to +35℃ . If so, capacity should be dropped according to the practical situations.
- 2.2 Used indoors. The altitude of the using location should be less equal to 2000m.
- 2.3 When the highest temperature is40℃ , the relative humidity of the temperature of the surrounding air must be less equal to 50%。 At the lowest temperature, a higher relative humidity is allowed: for example, 90% when it is + 20℃ . The influence of the occasional appearance of the moist because of the variety of the temperature should be taken into consideration.
- 2.4 The verticality of the installing device should be less equal to 5° and the whole group of boards should be relatively level.(meet the GBJ232-82 criteria)
- 2.5 The device should be installed in places without strenuous vibration and thrashing and not enough to corrode the electric components.
- 2.6 If the users have special requirements, they can contact the producer and solve them together.

产品型号及含义



主要技术参数 Main Technical Parameters

4.1 基本技术参数见表

the basic technical parameters are showed in table

表 table1

主电路额定电压 (V)		交流 380(400)、(660)
辅助电路额定电压 (V)		交流 220、380(400) 直流 10、220
额定频率 (Hz)		50(60)
额定绝缘电压 (V)		660(1000)
额定电流 (A)	水平接线	≤ 4000
	垂直母线 (MCC)	1000

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表 table2

母线额定短时耐受电流 (kA/1s)		50, 80
母线额定峰值耐受电流 (kA/0.1s)		105, 176
工频试验电压 (V/1min)	主电路	2500
	辅助电路	1760
母线	三相四线制	A. B. C. PEN
	三相五线制	A. B. C. PE.N
防护等级		IP3L0. IP4L0

4.2主电路方案

装置主电路方案共 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、供用电和其它电力用户的需要，额定工作电流 4000A，适合 2500kVA 及以下的配电变压器选用。此外，为适应供用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。

4.2The Main Circuit Scheme

There are altogether 32 groups and 118 specifications of schemes for installing main circuit, not including the schemes and specifications derived from the change of the controlling and the protection of the auxiliary circuit. And it includes the need of the electricity generation and supply as well as that of other electricity users. Its rated working current is 4000A, which applies to the electricity distribution transformer which is less equal to 2500kVA. In addition, the electric capacitor compensation board is designed for the need of raising the frequency factor of the using electricity. The reactance board is designed allowing for the need for comprehensive investment.

备注：

- 1. DW914是主选断路器，也可选用其它性能更先进或RDSW6(RDW1)、F、M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。
- 3. SDL、SDH是RGCS柜专用电源互感器。

Noting:

- 1.DW914 is the mainly chosen circuit breaker. Other circuit breakers with more advanced performance or the RDSW6(RDW1).F.M series can also be chosen.
- 2. 01,02,04 scheme: if the PE+N line needs to enter the source board, the width of the board should use the size put in the brackets.
- 3. SDL, SDH are the special source transformers of RGCS Board.

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4.3 辅助电路方案

RGCS 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。

直流控制电源为直流 220V 或 110V,交流控制电源为交流 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》。

4.4 母线(主母线的组合形式见 12 页附图 4、17 页附图 15)为提高母线动热稳定能力和改善接触面的温升,装置全部采用 TMY-T2 系列硬铜排,铜排的连接部分必须搪锡,推荐采用全长搪锡,也可选用全长镀银铜母线。

a. 水平母线

水平母线于柜后部母线隔室内,3150A 及以上为上下双层布置,2 500A 及以下为单层布置,每相由 4 条或 2 条母排组成,大大提高了母线的短路强度。

装置水平母铜排选用见表 3。表 table3

额定电流 A	铜排规范
630 1250	2 (50 × 5)
1600	2 (60 × 6)
2000	2 (60 × 10)
2500	2 (80 × 10)
3150	2 × 2 (60 × 6)
4000	2 × 2 (60 × 10)

b. 垂直母线

用于抽屉柜的垂直线采用“L”形硬铜搪锡母线。L 形母线规格(mm):(高 × 厚)+ (底 × 厚)(50 × 5)+ (30 × 5)额定电流100A

c.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)规格见表 4。

表 table4

相导线截面各 mm ²	选用 PE (N) 线截面 mm ²
500–720	40 × 5
1200	60 × 6
>1200	60 × 10

* 装置内垂直 PEN 线或 PE+N 线的规格全部选用 40×5

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4.5 电器元件选择

装置主要选用技术性能指标先进，采用引进技术国内已能批量生产的电器元件。

a. 主开关

630A 及以上的电源进线及馈线开关，主选 DW914 系列，也可以用 RDSW6(RDW1)、DW40、DW48 系列、AE 系列、3 WE 或 RDW17 系列，认为必要时，也可选用进口的 M 系列或 F 系列。

b. 630A 以下的馈线和电动机控制用开关，主要选用 RDM949 系列、RDM1 系列、塑壳开关也可以选用 NZM 系列、TM30 系列塑壳断路器。

c. 交流接触器，主要选用 CJX8 系列、CJX2(RDC6) 系列、CJX1 系列的接触器以及与之配套的热继电器、联锁机构。

d. 电流互感器全部采用森源电气有限公司监制的 SDH 系列、SDL 系列、SDL1 系列。(见 19 页附图 19)

e. 熔断器选用高分断能力的 HH15 系列刀熔和 NT00 系列。

f. 为提高主电路的动稳定能力，设计了 RGCS 系列专用的 CMJ 型组合式母线夹和绝缘支件，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，只需调正积木式间隔块即可适用不同规格的母线。

(见 12 页附图 5、18 页附图 16 ~ 17)

g. 为降低功能单元的间隔板、接插件、电缆头的温升，设计了 RGCS 柜专用的转接件，与同类产品产比较转接件热容量增大，温升降低。(见 13-14 页附图 6 ~ 8)

h. 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 RGCS 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。

4.3 The Auxiliary Circuit Scheme

The atlas of RGCS Auxiliary Circuit includes 120 auxiliary circuit schemes and it is divided into two volumes. The first volume AC manipulation part has altogether 63 schemes while the second volume direct current manipulation part has altogether 57 schemes.

The auxiliary circuit schemes in the direct current manipulation part are mainly used in the systems of the low-voltage factories of the transformer houses of power plants. They apply to the systems of the low-voltage factories whose capacity units are less equal to 200MW or over equal to 300MW. They also apply to the common controlling modes of the working (spared) source in cable, source feeder and feeders of the electric motor.

The auxiliary schemes in the AC manipulation part are mainly used the low-voltage systems of the mineral companies and high-rise constructions for altering electricity. There are 6 combination schemes for controlling the binary source manipulation. Controlling circuits for manipulating electric interlocking spared self-throwing, self-reset etc. are installed and can be directly adopted in project designing.

The direct current controlling source is 220V or 110V direct current. AC controlling source is 380V or 220V AC. The complete set of boards is made up of drawer units. 220V controlling source is introduced from the public controlling source which is especially installed for the controlling of the electricity supply of the pressure transformer inside the board. The public controlling source controls the pressure transformer without earthing. And 24V source is left for using when the weak signal light is needed.

The installing location of the energy meter, the way of introducing the pressure and other requirements of installing and using are explained in detail in the Instructions of the Programming of the auxiliary circuit diagram.

4.4 Bus bars (the combination patterns of the main bus bars are showed on page12 Attached Picture4 and page17 Attached Picture 15)

In order to improve the dynamic heat-stable ability of the bus bars and better the temperature rise of the contact surface, the device completely adopts TMY-T2 Series hard copper blocks. The connection between

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the copper blocks should be tin-patched. Thorough-length tin-patching and thorough-length silver-plating copper bus bars are recommended.

a. Level Bus Bars

Level bus bars are in the bus bar isolation house at the rear of the board. Those, which are over equal to 3150A, are laid out with upper and lower layers. Those, which are less equal to 2500V, are laid out with single layer. Each phase consists of 4 or 2 bus blocks, thus well improving the short-cut intensity of bus bars.

What to choose for installing level copper bus blocks is showed in the table3:

b. Vertical Bus Bars

The vertical block of the drawer board adopts “L” shaped hard copper tin-patching bus bars.

The specifications of the shaped bus bars: (height x thickness)+(bottom x thickness)

The rated current is 1000A.

c. Neutral Earthing Bus Bars

They adopt hard copper blocks. The specifications of the piercing level neutral earthing wires (PEN) or the earthing + neutral wires (PE+N) are showed in table4:

* The specifications of the vertical PEN wires or PE+N wires inside the device should all choose 40 x 5.

4.5 Choice for Electric Components

This device mainly adopts the electric components that have advanced technical performance criteria and which using has produced in batch at home introduced technique.

a. The Main Switch

The source in cable switches and the feeder switches, which are over equal to 630A mainly, choose DW914 series. RDSW6(RDW1), DW40, DW48 series and AE series, 3WE or RDW17 series can also be chosen. When it is necessary, M series or F series, which are introduced, can be chosen.

b. The feeder and electric motor controlling switches, which are less equal to 630A mainly, choose RDM949 series, RDM1series. Plastic-cover switches can also choose NZM series and TM30 series plastic-cover circuit breaker.

c. AC contactors mainly choose the contactors of CJX8 series, CJX2(RDC6)series, and CJX1 series and heat relays and interlocking mechanism which assort with the those contactors.

d. Current transformers all adopt SDH series, SDL series and SDL1 series, which are supervised and manufactured by Senyuan Electricity Co, Ltd. (consult the attached picture19 on page19)

e. Fuses choose HH15 series knift switch and NT00 series with high breaking capacity.

f. In order to raise the main circuit's dynamic-stable ability, CMJ type combining bus bar folders and insulation branching items are designed especially for RGCS series. High-intensity and burning-protection combining materials are used to heat the plastics and mold them. They have high insulation intensity, high self-extinguishing performance, unique structure and can apply to different specifications of bus bars after the modular blocks are adjusted. (Consult the attached picture 5 on page 12 and the attached picture 16-17 on page 18)

g. In order to decrease the temperature rise of the interblocks, joint bars and cable heads of the function units, commutators especially for RGCS boards are designed. Compared with the same kinds of products, the commutators have larger heat capacity and the temperature rise will be decreased. (consult the attached picture 6-8 on page 13-14)

h. When the designing department chooses new type electric components with better performance and more advanced technique according to the need of the customers, because of the commonality of the RGCS series boards, there won't be any difficulty in producing or installing them, which are resulted from refreshing electric components.

结构特点 (见 11 页附图 2)

- 5.1 装置的主构架采用 8MF 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。
- 5.2 装置各功能室严格分开，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。
- 5.3 装置柜体的尺寸系列如表

高	2200									
宽深	400		600		800			1000		
	800	1000	800	1000	600	800	1000	600	800	1000

- 5.4 功能单元
- a. 抽屉层高的模数为 160mm (见 14-15 页附图 9 ~ 10)。分为 $\frac{1}{2}$ 单元、1 单元、 $1\frac{1}{2}$ 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。
- 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 $\frac{1}{2}$ 单元的抽屉。其中一单元 以上抽屉采用多功能后板 (见 19 页附图 18)
- 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。(见 13-14 页附图 6 ~ 8)
- e. $\frac{1}{2}$ 单元抽屉与电缆室的转接采用背板式结构 ZJ-2 型转接件。转接件的外形见 13 页附 7。
- f. 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。转接外形见 13 页附图 6。
- g. 抽屉面板具有分、合、试验、抽出等位置的明显标志。(见 15-16 页附图 11 ~ 12)。
- h. 抽屉单元设有机机械联锁装置。(见 16-17 页附图 13 ~ 14)。
- 5.5 馈线柜和电动机控制柜设有专用的电缆隔室，功能单元室与电缆室内电缆的连接通过转接件或转接铜排实现，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，视电缆数量、截面和用户对安装维修方便的要求而定。(见 12 页附图 3)
- 5.6 装置的功能单元辅助接点对数一单元及以上的为 32 对， $\frac{1}{2}$ 单元的为 20 对，能满足自动化用户与计算机接口的需要。
- 5.7 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，装置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。
- 5.8 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。
- 5.9 装置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 或 PEN 方式。
- 5.10 柜体的防护等级为 IP3LO、IP4LO，也可以按用户需要选用。

Structural Features (consult the attached picture2 on page 11)

- 5.1 The main framework of the device adopts 8MF type steel. Its construction has two forms-consolidation and partial welding. All the main frameworks have installing modular holes E=20mm.
- 5.2 The individual function houses of the device are divided strictly. Its isolation house mainly includes function unit house, bus bars house and cable house. Each unit functions relatively independently.
- 5.3 The size series of the device board is showed in the following table (left)
- 5.4 Function Unit

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a. The module of the height of the drawer layer is 1600mm (consult the attached picture 9–10 on page14–15). There are five size series—1/2unit, 1unit, 1(1/2) units, 2units and 3 units. The rated current of the unit loop must be less equal to 400A.

b. varies its height size instead of width or depth sizes. Drawers belonging to the same function unit are of good interchangeability.

c. At most 11 one unit drawers or 22 one half unit drawers can be installed on each MCC board. Drawers whose units are more than one use multifunctional rear boards. (Consult the attached picture 18 on page19)

d. According to the amount of the current, the in–and–out cables of the drawers adopt the same type of with different pieces (Consult the attached picture6–8 on page 13–14)

e. The resetting between the unit drawers and the cable house adopts the backboard structure ZJ–2 type–resetting piece. Its appearance is shown on page13, attached picture 7

f. According to electricity grading, the resetting between the unit drawers and the cable house adopts the same size bar–type or the pipe–type structure ZJ–1 type resetting piece. (The resetting appearance is shown on page 19, attached picture 6.)

g. There are obvious marks of locations of switch–on, switch–off, trial and drawing–out on the drawer face. (Consult the attached picture11~12on page 15–16)

h. The mechanical interlocking equipment is installed in the drawer unit. (consult attached picture 13~14 on page 16–17)

5.5 The special cable isolation house is installed in the feeder board and the electric motor controlling board. The current connection between the function unit house and the cable house is realized by resetting piece of the resetting copper block. This not only increases the use reliability of the cables but also makes it convenient for the users to install, maintain and repair the cable.

Two width sizes (240mm and 440mm) can be chosen according to the number of the cables, the cross–section and the users– requirements for convenient installation, maintenance and fixing. (Consult attached picture 3 on page12)

5.6 The function unit auxiliary connection point of the device has 32 pairs when the unit is over equal to one, 20 pairs when the unit is 1/2. It can satisfy the need of automatic users and the port of the computer.

5.7 Considering the commonality and safety of using the dry–type pressure transformer and the economy of the oil–immersed pressure transformer, can easily form a group with the dry–type pressure transformer as well as be easily connected to the low–voltage bus bars of the oil–immersed pressure transformer.

5.8 The drawer is considered the main body. The draw–out version and the fixed–mounted version co–exist. They can be combined and chosen at random.

5.9 The device is designed according to triphase five–wire system and triphase four–wire system.

The designing department and the users can conveniently choose PE+N or PEN mode.

5.10. The protection grade of the board is IP3LO, IP4LO. It can also decided by the needs of the users.

装置特点

6.1 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。

6.2 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。

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- 6.3 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。
- 6.4 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。
- 6.5 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。零序电流互感器置电缆隔室内，使安装维修方便。
- 6.6 同一电源配电系统，可以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。
- 6.7 抽屉单元有足够数量的二次接插件（1 单元及以上为 32 对， $\frac{1}{2}$ 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。

Features of the device

- 6.1 It improves the heat capacity of the resetting piece, obviously decreases the additional temperature rise, which is brought to the patching piece, the cable head and the interval board because of the temperature rise of the resetting piece.
- 6.2 The isolation between one function unit and another as well as that between one isolation house and another is clear and trustworthy. The working of other units isn't influenced by the accident of a particular unit. Confine the accidents in the smallest range.
- 6.3 The level arraying of the bus bars betters the dynamic heat-stable ability. It can tolerate the attack of 80/176kA cutting-out current.
- 6.4 The loop quantity of MCC single board is so large that it reaches 22 loops. This fully allows for the need of profession automaticity electricity-driven door (machine) groups of single device capacity generation and petrification system etc.
- 6.5 The connection between the device and the outside cables is finished in the cable isolation house. Cables can be in and out from above or below. The zero order current transformers is installed inside the cable isolation house, thus making the installation and maintenance convenient.
- 6.6 Electricity distribution systems belonging to the same source can limit the cutting-out current, make the pressure of the bus bars stable at a certain number and can also partially decrease the requirements of the cutting-out intensity of the component pieces through the current-limiting reactance equipment match.
- 6.7 There are enough quadratic patching pieces (there are 32 couples when it is more equal to 1unit and 20 couples when it is 1/2 unit) in the drawer unit. They can meet what the computer port and the self-controlling loop require of the quantity of the connecting points.

安装与使用

- 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。
- 7.1 产品的安装应按示意图进行（见图 1 ~ 图 3，表 7 ~ 表 9）。基础槽钢和采用螺栓固定方式时的螺栓由用户自备。主母线连接时，如表面因运输、保管等原因有不平整时需平整后再连接紧固。
 - 7.2 装置单独或成列安装时，其垂直度以及柜面不平度和柜间缝隙的偏差应符合表 6 规定。

RGCS

型低压抽出式开关柜

表 table 6

项次	项 目		允差 (mm)
1	垂直度		3.3
2	水平度	相邻两柜顶部成列柜顶部	2
		相邻两柜边	5
3	不平度	成列柜边	1
			5
4	柜间接缝		2

7.3 产品安装后投运前的检查与试验

- a. 检查柜面漆或其它复盖材料（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，不应有卡涩或操作力过大现象。
- c. 主要电器的主辅触头的通断是否可靠、准确。
- d. 抽屉或抽出式机构抽拉应灵活、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. 相同尺寸的抽屉应能方便的互换，无卡阻和碰撞现象。
- g. 抽屉与柜体间的接地触头应接触紧密，抽屉当推入时，抽屉的接地触头经主触头先接触，拉出时接地触头比主触头后断开。
- h. 仪表的刻度整定、互感器的变比及极性应正确无误。
- i. 熔断器的熔芯规格应符合工程设计的要求。
- j. 保护的额定值及整定应正确，动作可靠。
- k. 用 1000 兆欧表测量绝缘电阻值不得低于 1mΩ。
- l. 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。

7.4 使用注意事项

- a. 装置为不靠墙安装，正面操作，双面维修的低压配电柜。柜的维修通道及柜门，必须是考核合格的专业人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. 经过安装和维修后，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。

Installation and Using

When the products arrive at the receiving location, first, examine whether the package is complete without destruction. If problems are found, notice the contractual concerned departments to make business record, analyze the cause together, give signatures and make funeral arrangements.

As for those products which won't be installed immediately, they should be safely kept in proper places according to the requirements of the normal using conditions and the temporary regulations for electric equipment.

7.1 Products should be installed according to the diagrammatic sketch (consult Illustration1-3,Table7-9). The basic box iron and the bolts when the fixing ways for bolts are adopted should be prepared by the users themselves. When the bus bars are connected, if their faces are made uneven because of transportation or custody, they should be made even and then connected tightly.

RGCS

Type low-voltage switchboards of the draw-out version

7.2 When the device is installed singly or in array, its verticality, the unevenness of the board surface and the deviation between the intervals insides boards should meet the regulations in table6.

7.3 The Examination and Trial before Committing the Installed Products

- a. Examine whether the surface paint or the other covering materials (such as the spraying plastic) are destroyed and whether it is clean inside the board.
- b. Whether the manipulation mechanism of the electric components is flexible. There should be no tensility or over force manipulation.
- c. Whether the opening and closing of the main and auxiliary ports of the main electric equipment are trustworthy and accurate.
- d. The drawers and the mechanism of draw-out version should be pulled flexibly, conveniently without prevention or crashing.
- e. The central lines of the dynamic and static ports of the drawers and the mechanism of draw-out version should be in agreement with each other. The connection of the ports should be tight. The interposing depth of the main and the auxiliary ports should meet the requirement. The mechanical interlocking or the electric interlocking mechanism should act correctly. Both the blocking and its release should be trustworthy.
- f. Drawers of the same size should be able to be interchanged conveniently without prevention or crashing.
- g. The connection of the earthing contactor between the drawer and the board should be tight. When the drawer is pushed in, the earthing contactor is firstly connected through the main contactor. When the drawer is pulled out, the earthing contactor is dropped out after the main contactor.
- h. The scale of the meter should be adjusted. The transformation ratio and the polarity of the transformer should be accurate.
- i. The specification of the fuse core should meet the requirements of the project designing.
- j. The rated quantity and the adjustment of protection should be accurate and the act should be trustworthy.
- k. The insulation electric resistance quantity measured by the 1000 me ohm meter should be over equal to 1 me ohm.
- l. The connection of each bus bar should be good. The installation of the insulation strutting piece, the installing piece and other additional pieces should be strong and trustworthy.

7.4 Matters which need attention while the device is used:

- a. The device is a low-voltage electricity distribution board which can't be installed along the wall and it is manipulated in the front face. It can be maintained from both faces. Only the professional workers who have passed the examination can enter, open, manipulate and maintain the maintenance gangway and the door of the board.
- b. After several times of opening and closing, especially after the cutting-out closing and opening, the contactors of the air circuit breaker and the plastic covering circuit breaker will be partially burned and produce carbonic matters, thus enlarging the connecting electric resistance. The circuit breakers should be maintained and inspected according to the instructions for using.
- c. After the installation and maintenance, the isolation status between one isolation house and another as well as that between one function unit and another should be inspected strictly in order to guarantee the good functional isolation of the device, preventing the accident from being enlarged.

RGCS

型低压抽出式开关柜

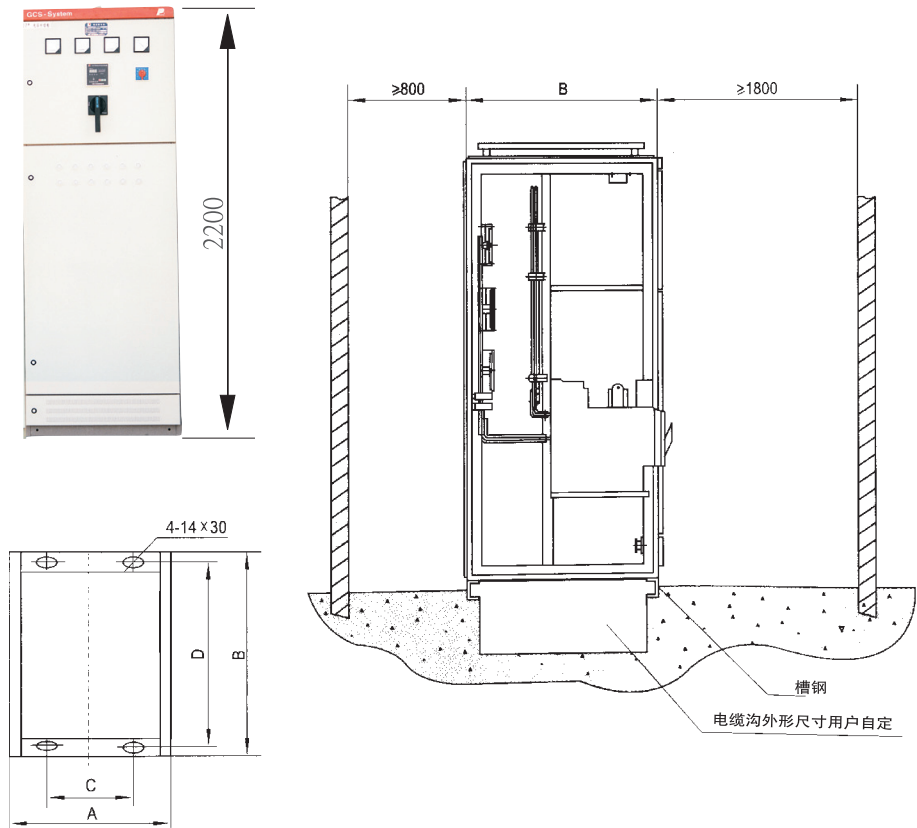


表 table7

通用柜代号	A	B	C	D	备注
RGCS-TG1010-4	1000	1000	850	956	联络柜
RGCS-TG0810-4	800	1000	650	956	受电柜
RGCS-TG0808-4	800	800	650	756	受电柜
RGCS-TG0608-4	600	800	450	756	受电柜

图 1 受电、联络柜安装示意图
Illustration I the diagrammatic sketch of installing the incoming and connecting board

RGCS

Type low-voltage switchboards of the draw-out version

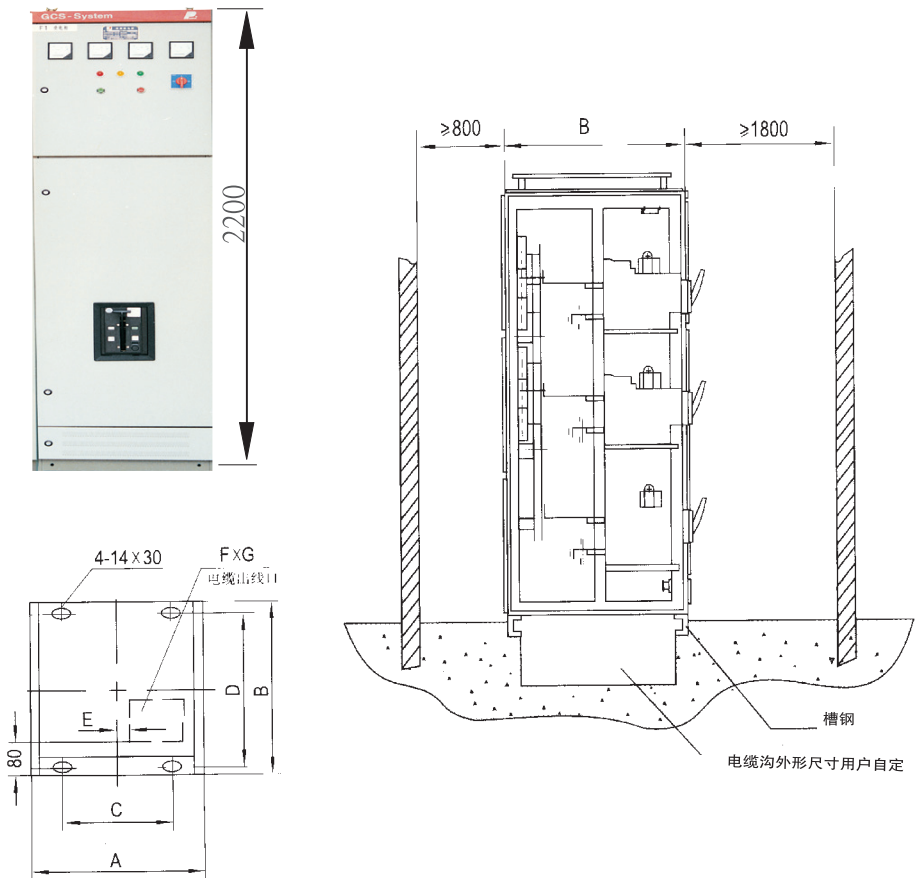


表 table8

通用柜代号	A	B	C	D	E	F × G
RGCS-TG1010-2	1000	1000	850	956	60	400 × 400
RGCS-TG0810-2	800	1000	650	956	160	200 × 400
RGCS-TG1008-2	1000	800	850	756	60	400 × 400
RGCS-TG0808-2	800	800	650	756	160	200 × 400

图 2 PC 柜安装示意图

Illustration II the diagrammatical sketch of installing the PC board

RGCS
型低压抽出式开关柜

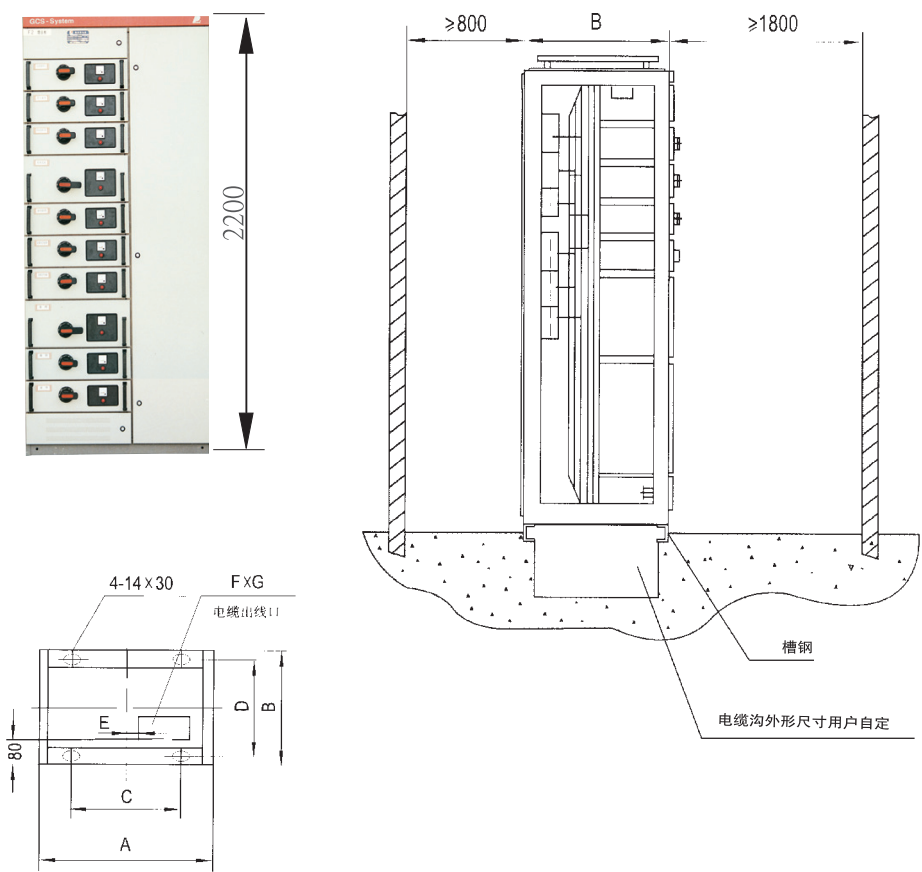


表 table9

通用柜代号	A	B	C	D	E	F×G
RGCS-G1006-1	1000	600	850	556	60	400×350
RGCS-G0806-1	800	600	650	556	160	200×350

图 3 MCC 柜安装示意图
Illustration III the diagrammatical sketch of installing the MCC board

RGCS

Type low-voltage switchboards of the draw-out version

附录RGCS基本系统构成及专用配套件

8.1 装置

装置的受电柜、动力馈电柜（PC）和电动机控制柜（MCC）全系列的母线短路强度均达到 80kA(有效值) / 176kA（峰值）的水平。填补了我国高短路强度抽出式开关柜的空白，具有国内领先水平。

PC 柜由三个单元馈线组成，每单元馈线最大电流 1600A。

PC 柜、MCC 柜的母线室，功能单元室和电缆室相互分隔。MCC 柜最多可由 22 个 1/2 功能单元组合。也可以按照 160mm 模数由 1/2 或以上功能单元混合组成。

可按需要实现抽出式单元和固定分隔式单元混合组装。

8.2MCC 通用柜构架

装置的框架由 8MF 型钢及专用连接件组装而成。型钢截面积大、有足够的刚度、组合原理简单、工艺性强、稳固性好。

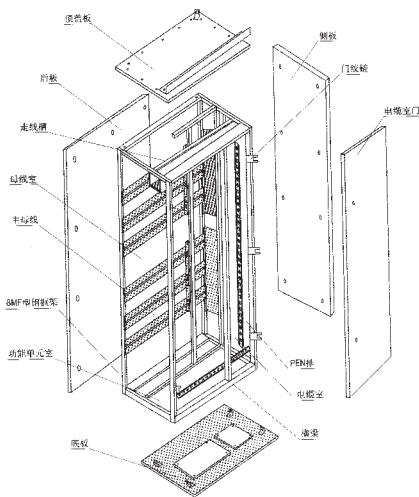
8.3 MCC 柜电气结构形式

MCC柜的垂直母线为 L 型，额定电流为1000A，额定短路强度达80kA(有效值) /176kA（峰值）。L 型垂直母线固定夹持在隔离板内，通过专用的母线过渡连接头与主母线相连接，功能单元的出线与 ZJ 型转接中，插接隔离板中的 L 型垂直母线与功能单元的进线插头相插接，功能单元的出线与 ZJ 型转接中插接。由转接件实现功能室和电缆室之间的电气转接。电缆室可根据设计需要选择 240mm 或 440mm 的室宽。

8.4 主母线

主母线的额定电流≤ 4000A。平置于柜后，用专用母线夹具固定在型钢框架上，安装方便，稳固性好，能承受 80kA（有效值）/176kA（峰值）短路电流的冲击。

装置工作电流≤2500A主母线为单组双列平置（如图示）。装置工作电流>2500A主母线为双组双列平置。一次母线推荐采用全长镀锡或镀银的工艺。水平母线和垂直母线之间的电气连接采用专用过渡连接头，可降低母线过渡搭接温升。



附图 2 MCC 通用柜构架

Figure II The Framework of the Universal MCC Board

RGCS

型低压抽出式开关柜

8.1 The DeviceThe cutting-out intensity of the bus bars of the incoming board, power feeder board (PC) and the whole series of the electric motor controlling board of the device has reached the level of 80kA (effective value) / 176kA (peak). It is of national advanced level and fills in the blank of the national high cutting-out intensity switchboards of the draw-out version.PC board consists of three unit feeders. The highest current for each unit feeder is 1600A.The bus bar house, function unit house and cable house of the PC board and the MCC board are separated from each other. MCC board can be made up of at most 22 one half function units. It can also be combined by function units which are over equal to one half unit according to 160mm modular. The combination between the draw-out unit and the fixing isolation unit can be realized according to needs.

8.2 The Framework of the Universal MCC BoardThe framework of the device is combined by 8MFprofiled bar and special connecting pieces. The cross-section of the profiled bar is very large. The profiled bar has enough rigidity, simple combination principles, good technological characters and good stability.

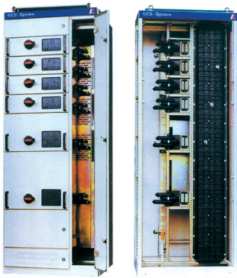
8.3 The electrical construction pattern of the MCC board

The vertical bus bar of the MCC board is shaped like an “L”Its rated current is 1000A. Its rated cutting-out intensity reaches 80kA (effective value) /176kA (peak). “L”shaped vertical bus bar is fixed and retained inside the isolation boards and is connected to the main bus bar through the special bus bar transitional connecting head. As for the out cable of the function unit and the ZJ type relay center, the “L”shaped vertical bus bar in the plugging isolation board is plugged to the in cable plug of the function unit while the out cable of the function unit is plugged to the ZJ type relay center. The electric patch between the function house and the cable house is realized by the patching piece. The width of the cable house can be either 240mm or 440mm according to the designing needs.

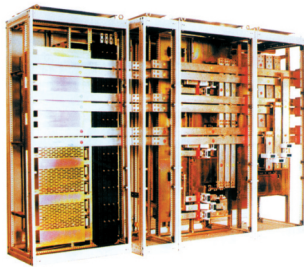
8.4 The Main Bus Bar

The rated current of the main bus bar must be less equal to 4000A.It is placed levelly at the rear of the board and is fixed on the framework of the profiled bar by special bus bar clamp. It is easy to install. It is of good stability and can tolerate the attack of the 80kA (effective value)/176kA (peak) cutting-out current.

When the working current of the device is less equal to 2500A, its bus bars are laid levelly in single group double array (as is showed in the picture). When the working current of the device is over 2500A, the bus bars are laid levelly in double groups double array. The technique of whole-length tin-plating or silver-plating is recommended to once bus bars. The special transitional connecting head is used to connect the electricity between the level and the vertical bus bars. This can decrease the lap joint temperature rise produced by the transition of bus bars.



附图 Attached picture3 MCC 柜电气结构形式



附图 Attached picture 4 主母线

RGCS

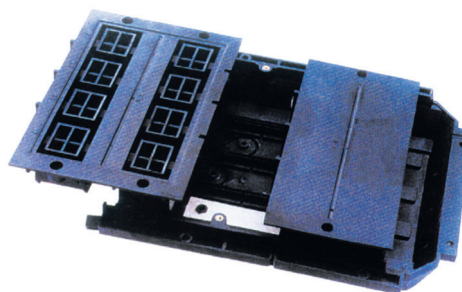
Type low-voltage switchboards of the draw-out version

8.5 隔离板

隔离板是为 MCC 柜设计的组合式的多功能母线间隔器具。整套隔离板由隔离板上端板、隔离板下端板、盖板、盖板上端板、盖板下端板、卡脚组成。它拼装简单、坚实、绝缘好、高阻燃、起到夹持 L 型垂直母线、隔离母线区和功能区的作用，还能为主回路插接提供接口。

8.5 The Isolation Board

The isolation board is compound multi-functional bus bar isolation equipment designed for MCC board. The whole set of the isolation boards consists of upper header of the isolation board, the lower header of the isolation board, the cover board, the upper header of the cover board, the lower header of the cover board and the jamming foot. It is simply and solidly combined. It has good insulation, high prevention from burning. It functions to hold the “L”shaped vertical bus bar, the isolation bus bar area and the function area. It can also provide the contactor for the plugging of the main loop of the function units.



附图 Attached picture5

8.6 ZJ-1 转接件

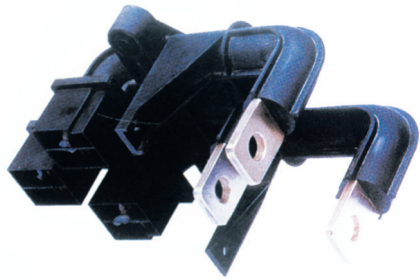
该转接件用圆铜棒 (400A) 或圆铜管 (250A) 弯曲成型，外表面包有增强尼龙塑料绝缘层和十二道加强筋。它能完成抽屉单元最大电流的转接。热容量大、强度好、结构型式新颖、呈品字形排列、占用空间小、电缆连接方便。

8.6 ZJ-I Resetting Piece

This resetting piece is melded from the round copper bar (400A) or the round copper pipe (250A). The enhancing nylon plastic insulation layer and 12 intensifying ribs cover its surface. It can finish the reset of the highest current in the drawer units. It has large heat capacity, good intensity, new structure pattern and it is arrayed like the word “ping” It occupies little space and the cables can be easily connected.

RGCS

型低压抽出式开关柜



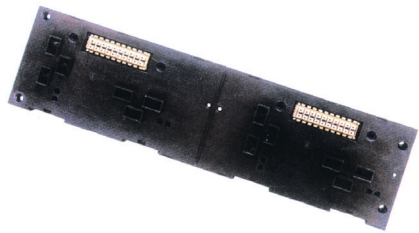
附图 Attached picture6

8.7 ZJ-2 转接件

该转接件由后板、左盖板、右盖板、小型母线、出线插头、出线压板组面。用于 抽屉单元的电路转接。进线采用铜母线接插头加装 U 型弹片，增大触头的压力。主辅电路出线直接从右侧转入电缆室。其结构合理、体积小、转接方便。

8.7 ZJ-2 Resetting Piece

The surface of this resetting piece consists of the rear board, the left cover board, the right cover board, the minitype bus bas, the out cable plug and the out cable pressure board. It is used to reset the current of 1/2 drawer unit. The in cables adopt copper bus bars. U type bullet is added to the patching head, enlarging the pressure of the contactor. The out cables of the main and auxilliary circuits are introduced directly into the cable house from the right side. With reasonable construction and small volume, it can be resetted easily.



附图 Attached picture7

8.8 ZJ-3 转接件

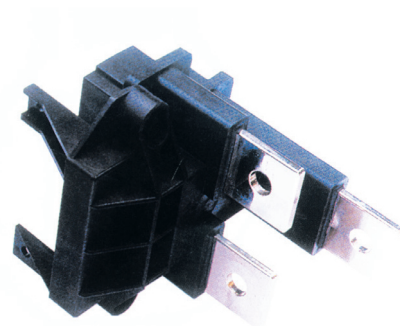
该转接件用于 PC 柜功能单元与电缆室之间的转接。它由 10×60 与 6×60 两种不同规格的三相铜排热塑而成。其转接方式简单，牢固，可靠。

8.8 ZJ-3 Resetting Piece

This reseting piece is used to reset the function unit and the cable house of the PC board. It is heated and molded from triphase copper blocks with two different specifications 10×60 and 6×60. Its reseting mode is simple, solid and trustworthy.

RGCS

Type low-voltage switchboards of
the draw-out version



附图 Attached picture8

8.9 $\frac{1}{2}$ 单元抽屉

该单元抽屉是由全塑组件装配而成，高阻燃、强绝缘、轻巧、牢固。它由前框、后框、侧盖板、导轨及拉手组成。在前框的左上方设有操作机构手柄安装座和手柄，在后框的上方有 20 对辅助电路插头。左右侧板带有能通风槽和加强筋。主要件不采用螺钉连接，由零件各自的槽口卡接完成。抽屉与 ZJ-2 型转件接插后，实现电路的转接。

8.9 1/2 Unit Drawer

This unit drawer consists of all plastic pieces. It is of high prevention from burning and sufficient insulation. It is solid, light and handy. It is made up of the front framework, the rear framework, the side cover board, the track and the handle. On the left upper part of the front board, the hand grip and the manipulation mechanism hand grip pedestal are installed. On the upper part of the rear board, there are 20 pairs of auxiliary current plugs. The left and right side boards have ventilating slot and dabber. The main pieces are connected by the daps of these pieces instead of by the screws. The resetting of the current is realized after the drawer is patched with the ZJ-2 type resetting piece.



附图 Attached picture9

RGCS

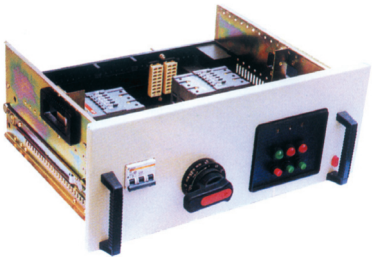
型低压抽出式开关柜

8.10 I 单元抽屉

该单元抽屉由抽屉面板、左右侧板、固定锁钩、前上支架、前下支架、后端板、测控板、抽屉底板、导轨、导杆等主要零部件组成。它抽屉灵活，定位准确。加上装有旋转操作机构，功能完备。

8.10 Unit Drawer

This unit drawer is made up of the main components such as the left and right side boards, the fixed latch hook, the front upper holder, the front lower holder, the rear terminal board, the measuring and controlling board, the bottom board of the drawer, the track and the guiding bar. It is flexible and located correctly. Its function is perfect with the spinning manipulation mechanism.



附图Attached picture 10

8.11 操作手柄 ($\frac{1}{2}$ 单元抽屉用)

I 工作位置：主开关合闸，功能单元锁定。

O 主开关分闸：主回路断开，功能单元锁定。

↗ 试验位置：主开关分闸，控制回路接通，功能单元锁定。

↖ 隔离位置：抽屉抽出 30mm。主、辅回路均隔离断开，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。

操作手柄压下 6mm 后，方能从 o 位置转向 I 位置，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。

8.11 The Manipulation Hand Grip (used by 1/2 unit drawers)

I The working location: the main switch is closed and the function unit is locked.

O The main switch opened: the main loop is cut and the function unit is locked.

↗ The trial location: the main switch is opened, the controlling loop is connected and the function unit is locked.

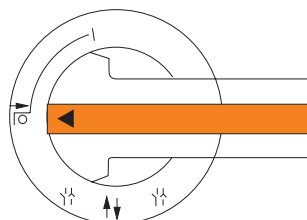
↖ The isolation location: The drawer is drawn off 30mm. Both the main loop and the auxiliary loop are cut and the drawer is locked.

↕ The drawn-off location: Both the main loop and the auxiliary loop are cut and the drawer can be drawn off at random.

Only after the manipulation hand grip is pressed down 6mm, can it be changed from location 0 to location 1. If necessary, the padlock can be added to the manipulation hand grip in places of the opening of the main switch, the trial and the isolation for safety protection.

RGCS

Type low-voltage switchboards of the draw-out version



附图 Attached picture 11

8.12 操作手柄 (1 单元及以上抽屉用)

I 工作位置：主开关合闸，功能单元锁定。

O 主 开关分闸：主回路断开，功能单元锁定。

↕ 试验位置：主开关分闸，控制回路接通，功能单元锁定。

↕ 隔离位置：旋出 30mm 距离，主回路及控制回路均隔离断开，功能单元锁定。

↕ 抽出位置：主回路和控制回路均断开，抽屉任意抽出。

操作手柄压下 9mm 后，方能从 O 位置转向 I 位置，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。

8.12 The Manipulation Hand Grip (used by drawers with units over equal to 1)

I The working location: the main switch is closed and the function unit is locked.

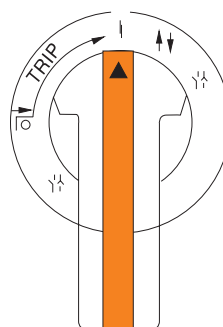
O The main switch opened: the main loop is cut and the function unit is locked.

↕ The trial location: the main switch is opened, the controlling loop is connected and the function unit is locked.

↕ The isolation location: The drawer is drawn off 30mm. Both the main loop and the manipulation loop are cut and the function unit is locked.

↕ The drawn-off location: Both the main loop and the auxiliary loop are cut and the drawer can be drawn off at random.

Only after the manipulation hand grip is pressed down 9mm, can it be changed from location 0 to location 1. If necessary, the padlock can be added to the manipulation hand grip in places of the opening of the main switch, the trial and the isolation for safety protection.



附图 Attached picture 12

RGCS

型低压抽出式开关柜

8.13 CJG-1 操作机构 (1 单元及以上抽屉用)

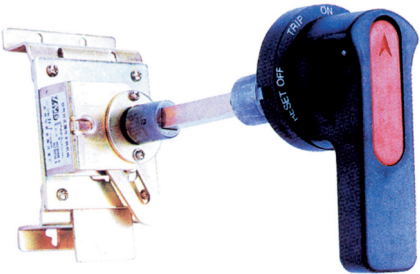
该操作机构由转轴、园柱形凸轮、离合齿片、轴销压簧、拨叉等组成。通过操作手柄转动园柱形凸轮可插拔抽屉并同时具备开关的分、合、试验、隔离及锁定功能。

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 (O)，将手柄压下 9 mm 顺时针转动 90° 后，主开关合闸，如需退出，则依次相反操作。

8.13 CJG-1 Manipulation Mechanism (used by drawers with units over equal to 1)

This manipulation mechanism is made up of the rotor, the cylindrical jaw, the on-off bits, the dowel setting bolt spring and the pull-out fork etc. Through the turning of the manipulation hand grip, the cylindrical jaw can insert and pull out the drawer and meanwhile it possesses the ability of the opening and closing of the switch, trial, isolation and locking.

The working process: Only in the drawing-off location, can the drawer be spun in and out. The manipulation hand grip reaches the isolation location after it is clockwisely spun 30° . Another clockwise 180° it reaches the trial location. Anther clockwise 30° it reaches the location of opening the switch. When the hand grip is pressed down 9mm and spun clockwisely 90° the main switch is closed. If you want to withdraw, take the reverse procedures in turn.



附图 Attached picture 13

8.14 CJG-2 操作机构 ($\frac{1}{2}$ 单元用)

该操作机构由传动部分、转轴、锁扣等组成，具有开关的分合、试验、隔离及锁定功能。

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 (O)。将手柄压下 6mm 顺时针转动 60° 后，开关合闸。如需退出，则依次相反操作。

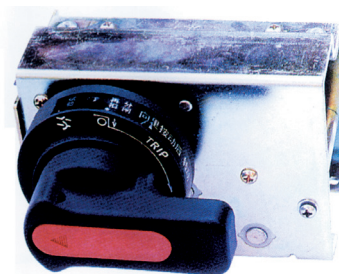
8.14 CJG-2 Manipulation Mechanism (used by 1/2 unit)

This manipulation mechanism is made up of the driving part, the rotor and the lock catch etc. It possesses the ability of the opening and closing of the switch, trial, isolation and locking.

The working process: Only in the drawing-off location, can the drawer be pushed in and pulled out. The drawn-off drawer automatically reaches the isolation location after it is anti-clockwisely spun 45° . After it is clockwisely spun 45° , it reaches the trial location. Another clockwise 45° , it reaches the location of opening the switch. When the hand grip is pressed down 6mm and spun clockwisely 60° , the switch is closed. If you want to withdraw, take the reverse procedures in turn.

RGCS

Type low-voltage switchboards of the draw-out version



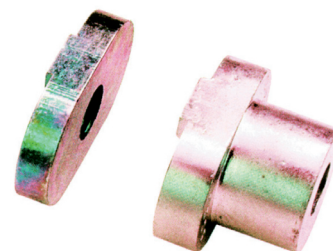
附图 Attached picture 14

8.15 母线过渡接头

主要功能是完成水平母线和垂直母线之间的电气连接。它由T形铜套、专用固定块和螺栓组成。接触压力大，能保证相应的接触面积和接触质量，使用方便。连接头整体镀银，长期工作电流为1000A。

8.15 The Bus Bar Transitional Contactor

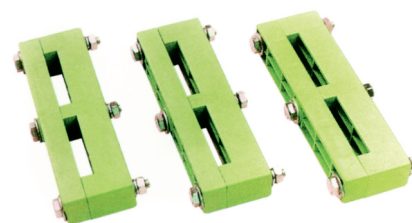
Its main function is to connect the electricity between the level bus bars and the vertical bus bars. It is made up of the “T” shaped copper jacketing, the special fixing block and the bolt. The big contact pressure can guarantee the corresponding contact area and contact quality. It can be used conveniently. The whole connecting head is silver-plating. The long-term working current is 1000A.



附图 Attached picture 15

8.16 母线夹

平置式水平母线夹具由母线夹座、盖板、绝缘垫座、不锈钢螺栓组成。安装方便、阻燃、强度好、使用安全可靠。



附图 Attached picture 16

8.16 The Bus-bar Clamp

The flat level bus-bar clamp composed of the bus bar folder pedestal, the cover board, the insulation backer and the non-rust steel bolt. It can be easily installed and be used safely and trustworthily. It has good intensity and prevention from burning.

RGCS

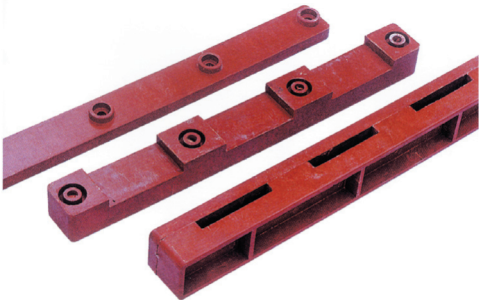
型低压抽出式开关柜

8.17 SJZ 型绝缘支撑夹

绝缘支撑夹由支撑夹座、支撑盖板组装而成。分单排单层、单排双层、双排单层、双排双层四种型式。在电源柜、PC 柜中用于夹持垂直分支母线，其结构简单，夹座与盖板之间的套筒式组合加大了电气间隙和爬电距离。能达到高绝缘、高强度的性能要求。

8.17 SJZ Type Insulation Supporting Clamp

The insulation supporting clamp is composed of the supporting clamp pedestal and the supporting cover board. It includes four types single block single layer, single block double layers, double blocks single layer and double blocks double layers. It is used to hold the vertical branching bus bars in the source board, It possesses simple structure. The sleeve-type combination between the clamp pedestal and the cover board enlarge the electric intervals and the creepage current space. It meets the performance requirement of high insulation and intensity.



附图 Attached picture 17

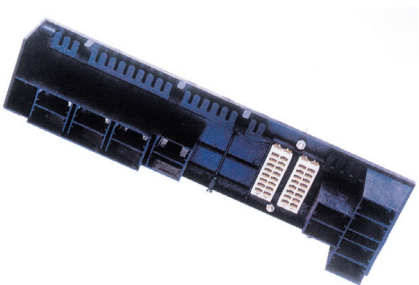
8.18 多功能抽屉后板

(1 单元及以下抽屉用)

由增强尼龙注塑成型，呈 U 型板状结构。上侧方有走线槽。左下侧方有进线电缆插座，右侧布有品字形电缆出线座还布有二排辅助插头的安装槽孔，同时具备抽屉的导向定位功能。

8.18 The Multi-functional Rear Board of the Drawer (used by the drawers with units less equal to1)

It is melded from the intensified nylon and plastic. It has “U”shaped board structure. On the upper side, there is a cable ditch. The in cable plug is installed on the lower left side. The “Ping”shaped leading-out cable plug and the two blocks of auxiliary plug installing slotted hole are installed on the right side. Meanwhile, it possessed the drawers ability of steering location.



附图 Attached picture 18

RGCS

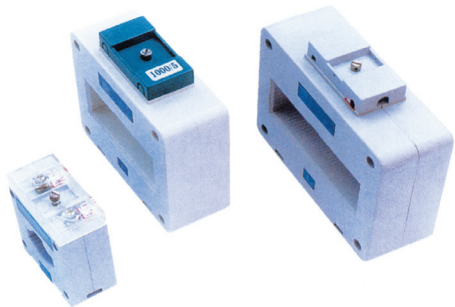
Type low-voltage switchboards of the draw-out version

8.19 SDH、SDL 系列电流互感器

用于装置的测量和零序检测。具有温升低、导磁率高、损耗低、漏磁小、补偿调节精细、体积小、固定容易的特点。外壳为高分子塑料注塑成型，性能指标高、阻燃性好、重量轻、强度大、外形美观。

8.19 Current Transformers of the Series SDH,SDL

It is used for the measuring and zero order inspection of the device. It has these features: low temperature rise, high magnetic inductive capacity, low deterioration, low leakance, delicate compensation adjustment, small volume and easy fixing. Its cover is melded from high molecular plastic. It has high performance criteria, good prevention from burning, light weight, high intensity and beautiful appearance.



附图 Attached picture19

订货需知

- 订货合同包含以下内容：
- 9.1 产品的全型号包括主电路方案号和辅助电路方案号；
 - 9.2 主电路系统组合顺序图；
 - 9.3 辅助电路电气原理图；
 - 9.4 柜内元器件清单；
 - 9.5 电路中电压、电流、时间等整定参数；
 - 9.6 与产品正常使用不符的其它特殊要求。

Ordering Instructions

- The ordering contract includes the following contents:
- 9.1 The whole model numbers of the product includes the scheme number of the main circuit and the auxiliary circuit.
 - 9.2 The combination precedence diagram of the main circuit system.
 - 9.3 The electric principle diagram of the auxiliary circuit.
 - 9.4 The list of the components inside the boards.
 - 9.5 The setting parameters of the voltage, current and time etc in the circuit.
 - 9.6 Other special requirements which don't apply to the normal using of the product.