ECC®

ECC-GCK

低压抽出式开关柜

Low Voltage Withdrawble Switchgear

中国·上海中科电气集团

SHANGHAI CHINA-SCIENCE ELE.GROUP, CHINA

上海人民电力设备股份有限公司

SHANGHAI RENMIN ELECTRIC POWER EQUIPMERIL CO., LTD.

用途

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。

特点

本系列产品具有分断能力高，动热稳定性好，结构先进、合理，电气方案切合实际，系列性，通用性强，各种方案单元任意组合，一台柜体所容纳的回路较多，节省占地面积，外形美观，防护等级高，安全可靠，维护方便等优点。

本产品符合IEC439 NEMA ICS2–322标准，也符合GB7251–87《低压成套开关设备》国家标准和ZBK36001–89《低压抽出式成套开关设备》专业标准。

运行环境

- 海拔不超过2000m；
- 周围空气温度不高于+40℃，并且24h内平均温度不高于+35℃，周围空气温度不低于–5℃；
- 大气条件：空气清洁，相对湿度在温度为+40℃时不超过50%，在温度较低时间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℃；
- 如上述使用条件不能满足时，应由用户在订货时向制造厂方提出，协商解决。

结构特征

本系列产品的基本框架为组合装配式结构，柜架的全部结构件通过螺钉紧固互相连接成基本框架，再按需要加上门、档板、隔板、抽屉、安装支架以及母线和电器组件等零件，组装成一台完整的开关柜，本柜有下列特点：

- 框架采用形钢材、利用三维角板定位，螺栓连接无焊接结构从而避免了焊接变形和应力，提高了安装精度。
- 框架及零部件安装扎按模数E=20mm变化。
- 内部结构件采用镀锌处理.外部经酸洗和磷化处理后,采用静电环氧粉末喷涂。
- 在动力中心（PC）进线柜内，顶部为水平母线区域，水平母线区域下部为断路器室，断路器可配置国产的DW15C、ME等系列，也可根据用户需要配置国外电气公司生产的各种断路器，如：ABB公司生产的F系列断路器，以及智能化断路器。

Application

The GCK Low Voltage Withdrawout Switchgear, composed of Power Center (PC) and Motor Control Center (MCC), is suitably used for power consumers such as power plants, substations, manufacturing and mining enterprises etc. in AC 50Hz distributing systems with rated working voltage up to 660V, rated working current up to 3150A for electric conversion, distribution and control of power, lighting and distributing apparatus.

Feature

Featuring high breaking capacity, high peak value and short time withstand current, advanced and reasonable structure, practical electric schemes, series and general purpose orientation, this series of products can combine different schemes, hold more circuits in a single bay, save land area with advantages of eye-appealing, higher class of protection, safety and reliability and easy maintenance.

This product complies with IEC 439, NEMA, ICS – 322 as well as China national standard GB 7251 Low Voltage Complete Set Switchgear and China electric industry ZBK 36001 – 89 Low Voltage Withdrawout Complete Set Switchgear.

Working conditions

- The altitude of application site not over 2000 meters above sea level.
- Ambient temperature not higher than +40℃ nor lower than -5℃ with 24-hour average not more than +35℃.
- Atmospheric condition: air clean. The relative humidity of ambient air not exceeding 50% at the maximum temperature of+40℃, and higher humidity permissible at lower temperatures, e.g., 90% at +20℃.
- Places where there is no potential conflagration and explosion, nor severe pollution, chemical corrosion, nor severe shock.
- The inclination to vertical surface when installation not over 5%.
- The product is suitably transported and stored between -25℃ ~ +55℃ and not over +70℃ within a short period of time (not over 24 hours).
- If the above mentioned working conditions can not be satisfied, users are supposed to submit this issue to the manufacturer for discussion and resolution.

Features in structure

The basic cubicle body of this series of our products is of combination and setup structure. The whole structural parts of the frame are formed through tight connection of each other with screws into a kind of basic cubicle body. Then add doors, stop plates, partitions, drawers, mounting supports, busbars and necessary electric components and subassemblies according to requirements as to form a complete set of switchgear. This switchgear has the following features:

- Prototype steel materials for the cubicle body, 3 dimensional angle plate for positioning and screw connection without welding so as to avoid welding deformation and stress and enhance assembly accuracy.
- The fixation of assembly holes for cubicle body and components are distributed as per modulus E=20mm.
- The internal structural parts are galvanized whereas the external parts are static epoxy powder sprayed after pickling up and phosphorous treatment.

在一般情况下，PC单元带有有翻排的主电路（包括母联）、额定电流在630A−1600A时，占据一个外形尺寸800×1000×2200（宽×深×高）的柜体。没有翻排的主电路占据一个外形尺寸为800×800×2000（宽×深×高）的柜体。额定电流在1600A−3150A时，占据一个外形尺寸为1000×800×2200（宽×深×高）的柜体。

动力中心（PC）馈电柜结构与进线柜相似，馈电电流在630A−1600A时，一个1000×1000×2200（宽×深×高）的柜体可装二个回路，为上下布置安装。

- 电动机控制中心（MCC）开关柜有靠墙安装和不靠墙安装二种，其顶部都为水平母线区域，水平线线区域下面为抽屉功能单元区域，该区域的宽度为600mm，安装抽屉功能单元区域的高为1840mm，当械体为靠墙安装时柜的左部为功能单元区域，右部有一个200mm宽的电缆出线区域，柜体外形尺寸为800×500×2200（宽×深×高），当柜体为离墙安装时，柜体宽度为600mm，电缆出线区在柜体的后部，柜体的外形尺寸为600×800（1000）×2200（宽×深×高）。柜体深度有800和1000二种，我们建议用户选用1000深的柜体，以与PC柜深度统一，当抽屉抽出柜外时，柜内带电部分不外露，安全可靠。
- 抽屉功能单元与门由主开关的操作机构进行机械联锁，主开关在合闸位置时门打不开，并且操作机构可采用外加挂锁锁定在合闸或分闸位置。功能单元隔室之间用金属板分隔，抽屉具有良好的互换性，并具有工作位置，试验位置和分离位置。当抽屉推到某个位置时，抽屉自动定位，此时可拉动抽屉左边的拉板抽屉可解除定位，进入下一个位置，抽屉抽出柜外时还具备防脱落功能。
- 在电容补偿、计量等固定式方案的柜体与抽屉式柜体具有同样的外观造型，同样的水平母线位置。从而保证了抽屉式与固定式柜体能够并排使用。
- 母线系统，柜体的母线采用三相五线制，水平母线额定电流在1250A及以下时采用单母线，水平母线额定电流在1250A以上时采用双母线，柜与柜之间的水平线线采用连接块搭接，垂直母线采用镀锌板封闭，内部用隔板限制电弧扩散，中性母线设置在柜顶的前部，保护母线（PE）设置在柜底部，并与柜体的隔板，门相连，从而保证了接地连续性。
- 在不降低外壳防护等级的情况下，开关柜底部和顶部设有自然通风窗口。
- 柜体外壳防护等级为IP40。

- In power center (PC) incoming cubicle, top area is for horizontal busbars. The lower part next to the horizontal busbar area is located the circuit breaker compartment which may hold both domestic series of circuit breakers such as DW15C and ME Series Circuit Breakers, and overseas company made circuit breakers just as per users' requirement such as ABB's F Series and intelligent type circuit breakers to name just a few.

  In general situations, there is a folded busbar main circuit (including bus tie) in PC unit. Under the rated current of 630A ~ 1600A, the folded busbar occupies a cubicle body of 800(width) ×1000(depth) × 2200(height) whereas unfolded busbar occupies a cubicle body of 800(width) ×800(depth) × 2000(height). Under the rated current of 1600A ~ 3150A, the folded busbar occupies a cubicle body of 1000(width) ×1000(depth) × 2200(height) whereas unfolded busbar occupies a cubicle body of 1000(width) ×800(depth) × 2200(height).

  The structure of power center (PC) feeder cubicle is similar to that of incoming cubicle. Under 630A ~ 1600A feeding current, a cubicle of 1000(width) ×1000(depth) × 2200(height) can hold two circuits in up and down arrangement.
- There are two kinds of installation modes for motor control center (MCC) switchgear, i.e., installation against wall or not against wall. Horizontal busbar area is situated at top part of the cubicle whereas drawer functional unit area is located below the horizontal busbar area with a width of 600mm and a height of 1840mm. If the cubicle is installed against a wall, the left part of the cubicle is functional unit area and a cable outgoing area with a width of 200mm occupies the right part of the cubicle. The overall dimensions of the cubicle are 800×500×2200 (W×D×H). If a cubicle with a width of 600mm is installed not against a wall, the cable outgoing area is located at rear of cubicle. The overall dimensions of this cubicle are 600×800(1000)×2200 (W×D×H).There are two dimensions for the cubicle width, i.e., 800mm and 1000mm, yet we suggest users use 1000mm width cubicle so as to the same depth for PC cubicles. When the drawer is withdrawn to the outside of the cubicle, no exposed live parts in cubicle will appear. Hence safety and reliability is guaranteed.
- Drawer functional units and the door are mechanically interlocked with the operating mechanism of the main switch. The door can not be open when the main switch is closed. The operating mechanism may be locked at closed or open position with a pad lock added. The functional unit compartments are separated with metal partitions. There are work position, test position and isolated position for drawers. Drawers with same specification are well interchangeable. When the drawer is pushed in cubicle to a certain position, it is automatically blocked in the position. The block may be disabled by pulling a plate on left side of the drawer. Then you can pull or push the drawer to the next position. And still more, when the drawer is pulled out of cubicle, anti-drop out function works efficiently.

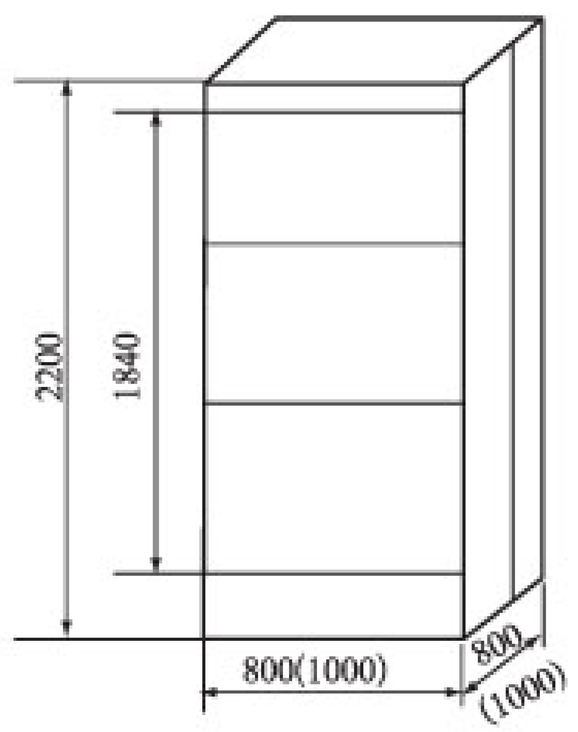
- Busbar system: Three phase five wire system. Single busbar for horizontal busbar with rated current up to 1250A and double busbar is used for horizontal busbar with rated current of over 1250A. Horizontal busbars from cubicle to cubicle are jointed with joining blocks. Vertical busbars are sealed by galvanized sheet steel, and partitions are used in between to restrict arc from spreading. Neutralized busbar is set on the front of cubicle top whereas protective busbar (PE) is set at cubicle bottom, connecting to partition in cubicle, and doors to ensure earthing continuity.
- Under the condition that no reduction of protection degree on enclosure, natural ventilation windows are set on top and at bottom of the cubicle.
- The protective degree for cubicle enclosure is IP40.

技术数据 Main technical parameters

表1

序号 NO	名 称 Description		数据 Value
1	额定工作频率(Hz) Rated working frequency		50
2	额定工作电压(V) Rated working voltage		380，660
3	额定绝缘电压(V) Rated insulating voltage		660
4	额定工作电流(A) Rated working current	水平母线 Horizontal busbar	630-3150
		垂直母线 Vertical busbar	600
5	额定短时耐受电流(kA rms/s) Rated short-time withstand current	水平母线 Horizontal busbar	80
		垂直母线 Vertical busbar	50
6	额定峰值耐受电流(kA) Peak value withstand current	水平母线 Horizontal busbar	176
		垂直母线 Vertical busbar	110
7	主电路接插件(A)	Inserts for main circuit	200，400
8	辅助电路接插件(A)	Inserts for auxiliary circuit	10
9	工频耐压1分钟(V)	Power frequency withstand voltage	2500
10	控制电机最大容量(kW)	The max. capacity of the motor to be controlled	155
11	防护等级	Class of protection	IP40
12	操作方式	Operation mode	就地，远方，自动

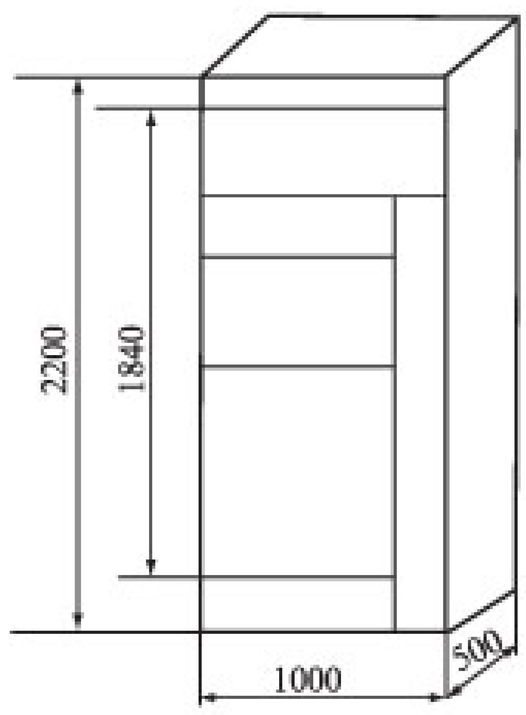
外形尺寸 Overall and installation dimensions



PC柜外形尺寸 注:1840尺寸区域为功能单元区域

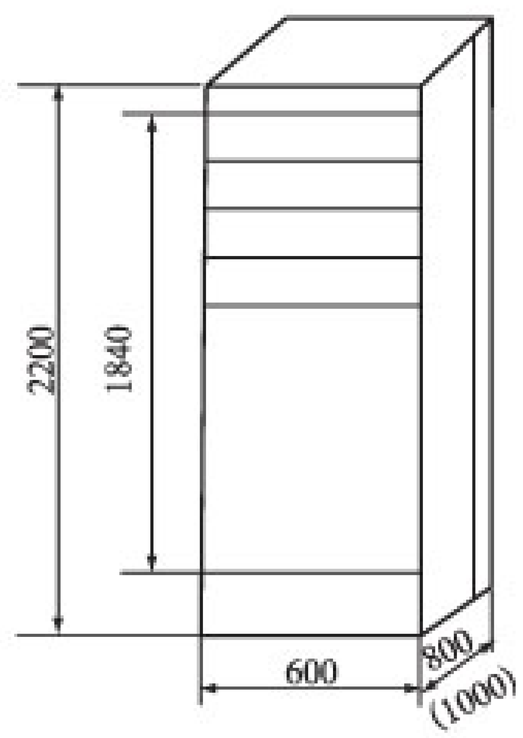
PC overall dimensions

Note: 1840mm area is for functional unit area



靠墙安装的MCC柜外形尺寸

MCC overall dimensions for installation against wall



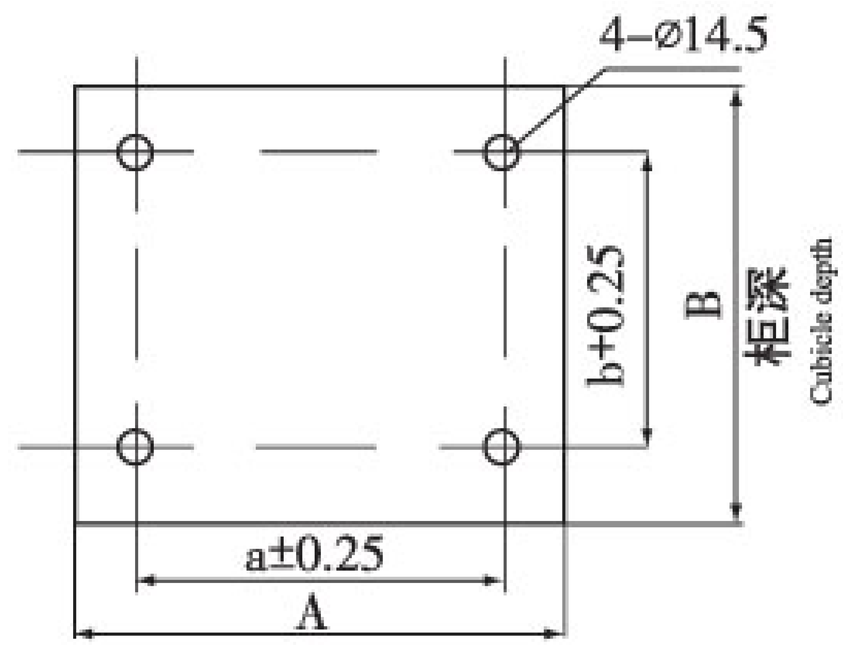
离墙安装的MCC柜外形尺寸

MCC overall dimensions for installation not against wall

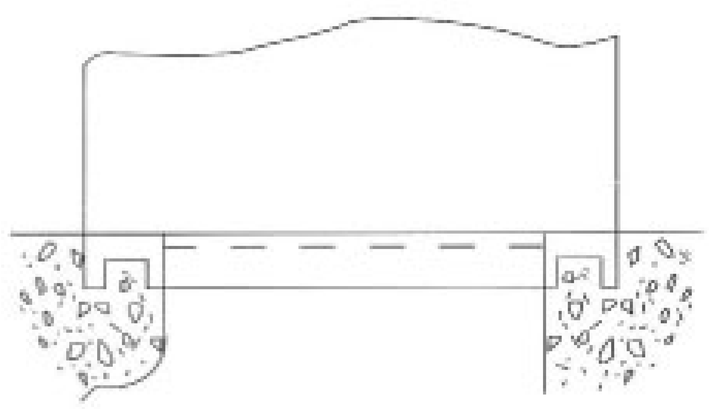
安装尺寸及安装孔 The following table shows installation dimensions and fixation holes

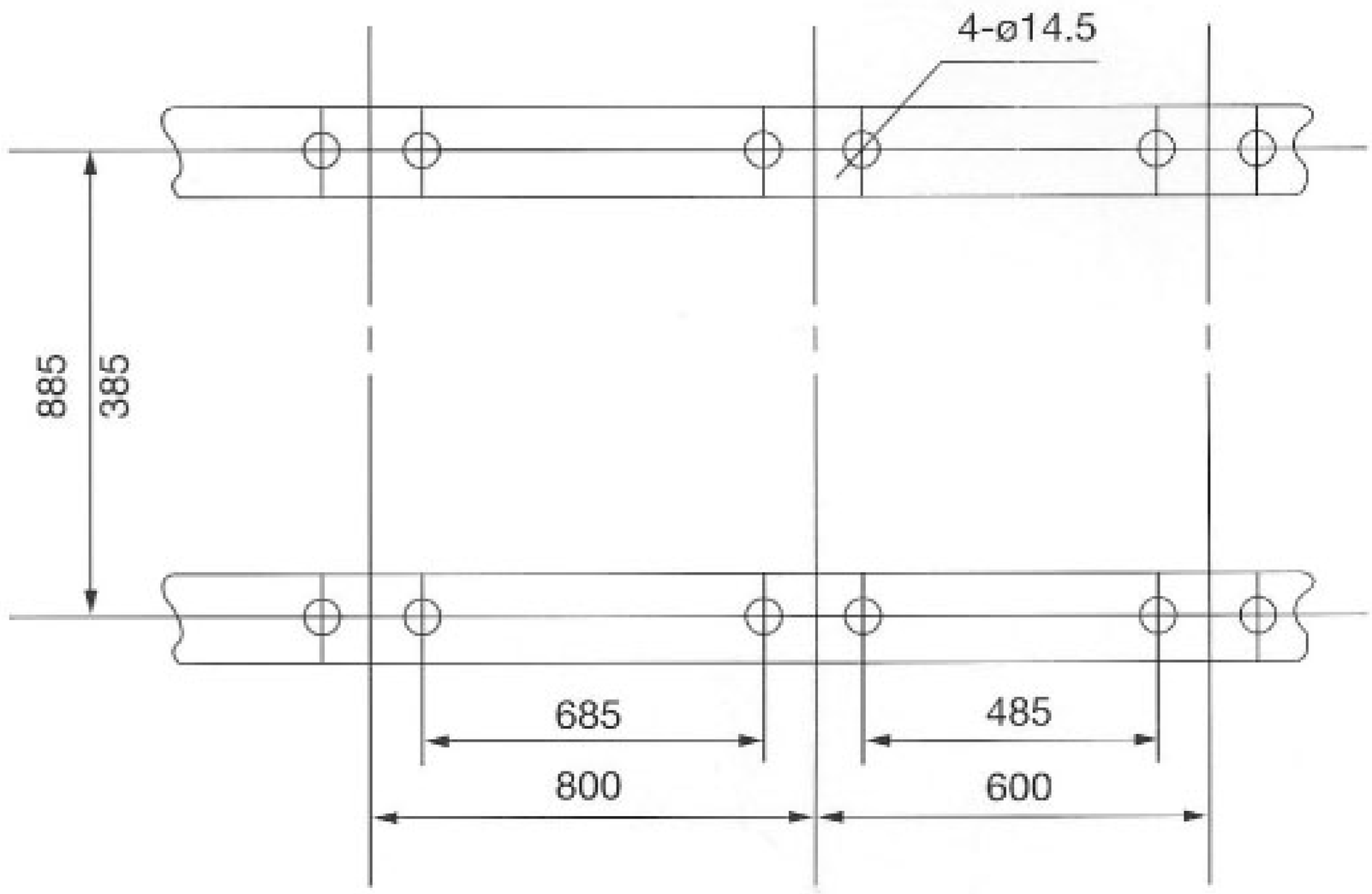
表2

柜宽 Cubicle width	柜深 Cubicle depth	安装孔距 Distance between fixation holes	安装孔距 Distance between fixation holes
800	500	685	385
600	800	485	685
600	1000	485	885
800	800	685	685
800	1000	685	885
1000	800	885	685
1000	1000	885	885



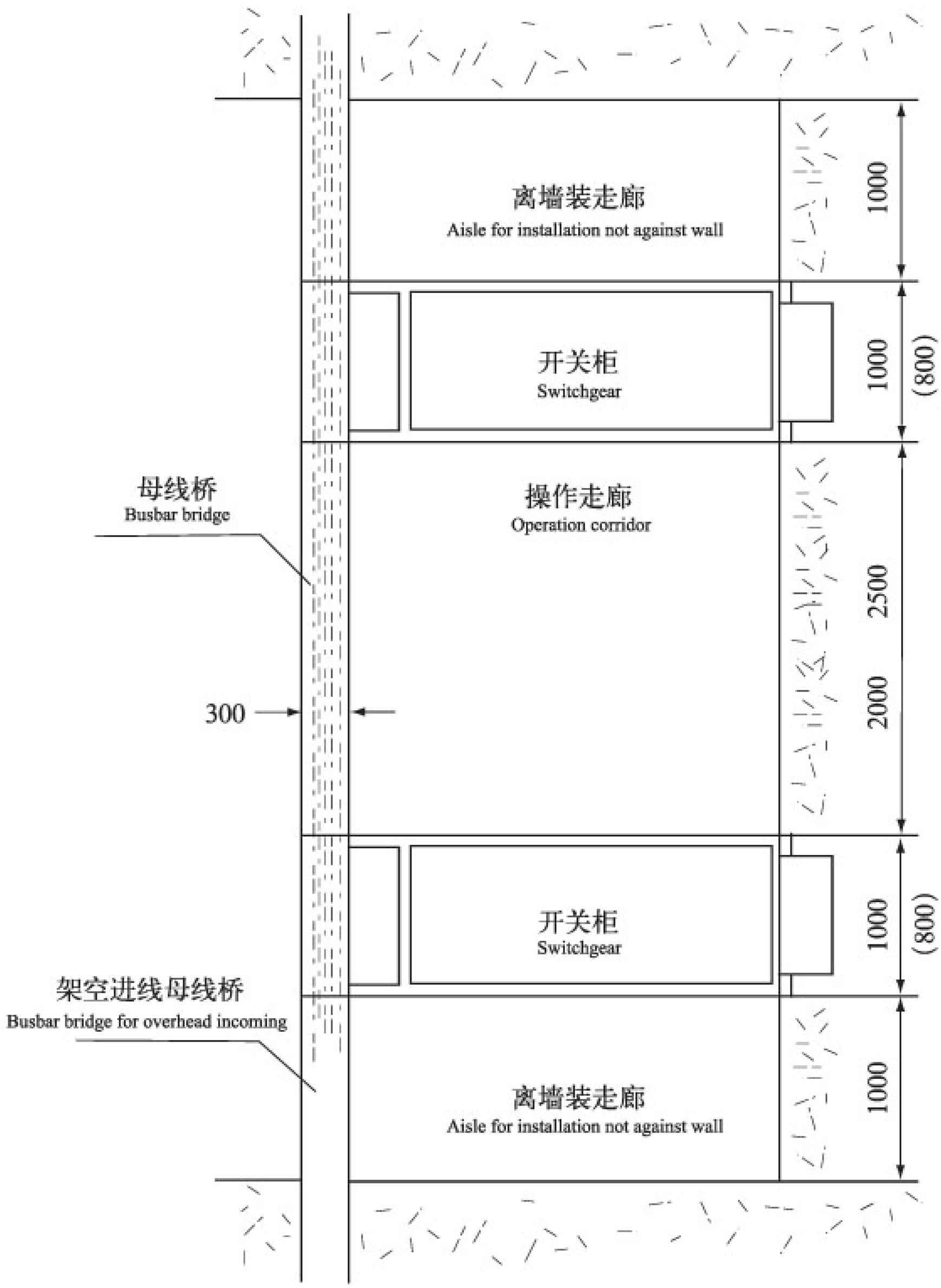
产品安装基础 Civil foundation for installation





产品安装基础 Civil foundation for installation

产品户内布置及母线桥架要求 Requirements for indoor arrangement and busbar bridge support



注： 本公司可根据用户要求提供各种形式的母线桥架
Note: ECC may supply various types of busbar bridges as per customers' demand.

订货需知

用户订货时应提供下列资料

- 一次回路方案编号、设备型号、容量及单线系统图；
- 二次回路原理图如用户未提供要求，制造厂按标准提供；
- 开关柜的排列图和配电室平面布置图；
- 主母线规格未提供要求时制造厂按标准提供；
- 开关柜表面颜色
  (制造厂家标准颜色为：浅豆色)；
- 若用户有其他要求可与我厂协商解决。

特别提示

- 本产品在安装时，柜与柜之间的水平线线应连接牢固可靠。
- 本产品的门与主开关有联锁功能，即只有在断电的情况下门才可能打开，本产品的其它侧面为螺钉封板，与主开关没有联锁功能，故请用户在拆开本产品侧板检修时，务必断开电源。
- 非专业人员请铁打开柜体维护检修。

Information given when ordering

When ordering, customers are supposed to provide with following information:

- Primary scheme No., product type, capacity and single line system drawing;
- If there is no secondary schematic drawings available from customer, the manufacturer will supply the product as per standard;
- Switchgear arrangement drawing and plane layout for distributing room;
- If there is no specification of main busbar available to the manufacturer, the manufacturer will supply the product as per standard;
- Surface color of the switchgear (the standard color is light grey);
- If customers have other requirements, contact the manufacturer for solution.

Special attention

- During installation, horizontal busbars between cubicles should be connected reliably and rigidly.
- As there is interlocking between the door and the main switch, only in open position of the main switch can the door be possible to open. There is no interlocking between side boards and the main switch, therefore, users are supposed to disconnect power supply for maintenance in case side boards must be removed.
- Unqualified professional persons are prohibited to open the cubicle for maintenance.

主电路方案 Primary scheme

表 3 (Table 3)

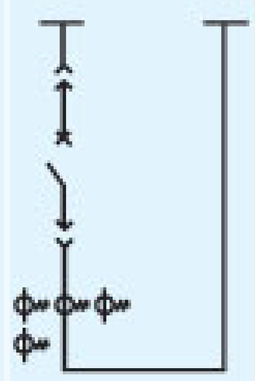
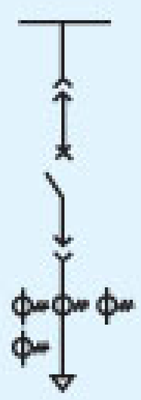
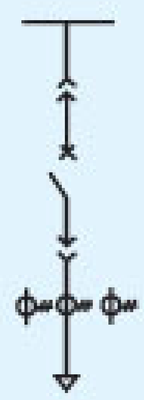
方案号 Scheme NO.	01		02		03		04		05		06		
	A	B	A	B	A	B	A	B	A	B	A	B	C
一次方案 Primary scheme													
电机功率KW Power consumption of motor													
单元额定电流A Unit rated current	1600	2500	1600	2500	1600	2500	630	1250	630	1250	125	250	400
单元高度MM Unit height	1840		1840		1840		920		920		160	400	480
主要设备 Main electric apparatus	ME,AH LMZ3-0.66		ME,AH LMZ3-0.66		ME,AH LMZ3-0.66		DW15C,ME AH LMZ3-0.66		DW15C,ME AH LMZ3-0.66		QSA HH15		
分断能力KA Breaking capacity	50		50		50		50		50		50		
用 途 Application	进线或母联 Incoming or bus tie		下进线 Down incoming		上进线 Up incoming		馈电 Feeder		馈电 Feeder		馈电 Feeder		

表 3 (Table 3)

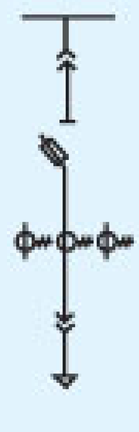
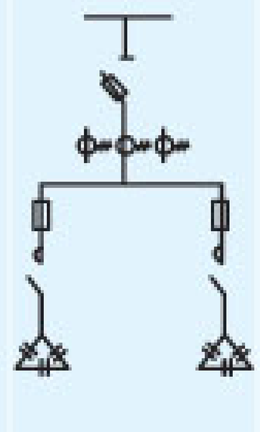
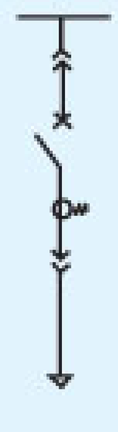
方案号 Scheme NO.	07			08			09	10			11			12		
	A	B	C	A	B	C		A	B	C	A	B	C	A	B	C
一次方案 Primary scheme																
电机功率KW Power consumption of motor							160									
单元额定电流A Unit rated current	125	250	400	125	250	400	300	140	250	400	150	250	400	150	250	400
单元高度MM Unit height	160	400	480	160	400	480	1840	240	400	560	240	400	560	240	400	560
主要设备 Main electric apparatus	QSA HH15 LMZ3-0.66			QSA HH15 LMZ3-0.66			QSA HH15 CJ16 LMZ3-0.66	HFB HKB HLA TO DZ20			HFB HKB HLA TO,DZ20 LMZ3-0.66			HFB HKB HLA NT LMZ3-0.66		
分断能力KA Breaking capacity	50			50			50	50			50			50		
用 途 Application	馈电 Feeder						补偿 Compensation	馈电 Feeder								

表 3 (Table 3)

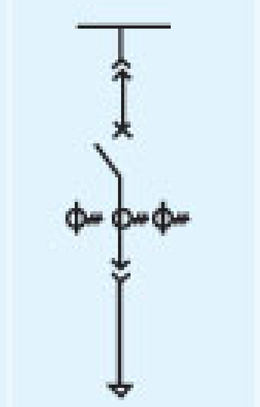
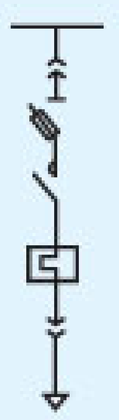
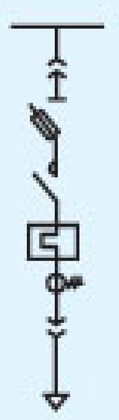
方案号 Scheme NO.	13			14			15			16		17			
	A	B	C	A	B	C	A	B	C	A	B	A	B	C	D
一次方案 Primary scheme															
电机功率KW Power consumption of motor										0.52-32	32-55	0.52-32	32-55	55-75	75-95
单元额定电流A Unit rated current	150	250	400	150	250	400	150	250	400						
单元高度MM Unit height	240	400	560	240	400	560	240	400	560	240	320	240	400	480	
主要设备 Main electric apparatus	NT HFB HKB HLA,TO DZ20			NT HFB HKB HLA,TO DZ20 LMZ3-0.66			NT HFB HKB HLA,TO DZ20 LMZ3-0.66			HH15 QSA B CJ20 3TB T JR16 3UA		QSA HH15 B CJ20 3TB T JR16 3UA LMZ3-0.66			
分断能力KA Breaking capacity	50									50		50			
用 途 Application	馈电 Feeder									不可逆 Not inversion		不可逆 Not inversion			

表 3 (Table 3)

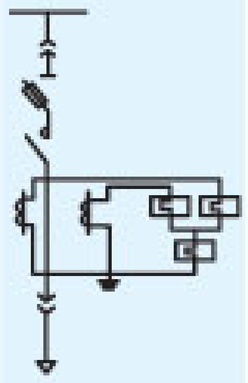
方案号 Scheme NO.	18				19	20		21			
	A	B	C	D		A	B	A	B	C	D
一次方案 Primary scheme											
电机功率KW Power consumption of motor	0.52-32	32-55	55-75	75-95	95-155	0.52-32	32-55	0.52-32	32-55	55-75	75-95
单元额定电流A Unit rated current											
单元高度MM Unit height	240	400	480		640	240	320	240	400	480	
主要设备 Main electric apparatus	QSA HH15 B CJ20 3TB T JR16 3UA LMZ3-0.66				QSA HH15 B CJ20 JR16 3UA LMZ3-0.66	HFB TO B CJ20 JR16 3UA		HFB HKB TO B CJ20 3TB T JR16 3UA LMZ3-0.66			
分断能力KA Breaking capacity	50				50	50					
用 途 Application	不可逆 Not inversion				不可逆 Not inversion	不可逆 Not inversion					

表 3 (Table 3)

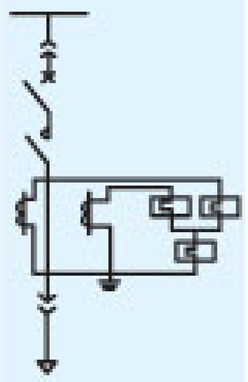
方案号 Scheme NO.	22				23	24		25			
	A	B	C	D		A	B	A	B	C	D
一次方案 Primary scheme											
电机功率KW Power consumption of motor	0.52-32	32-55	55-75	75-95	95-155	0.52-32	32-55	0.52-32	32-55	55-75	75-95
单元额定电流A Unit rated current											
单元高度MM Unit height	240	400	480		640	240	480	240	400	480	
主要设备 Main electric apparatus	HKB TO B CJ20 3TB T JR16 3UA LMZ3-0.66				HLA DZ20 B CJ20 T JR16 3UA LMZ3-0.66	HH15 QSA B CJ20 T 3UA JR16		QSA HH15 B CJ20 T JR16 3UA LMZ3-0.66			
分断能力KA Breaking capacity	50				50	50					
用 途 Application	不可逆 Not inversion				不可逆 Not inversion	可逆 Inversion					

表 3 (Table 3)

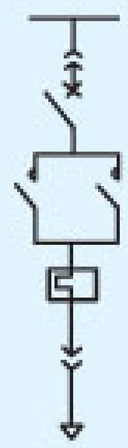
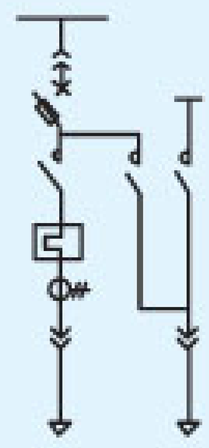
方案号 Scheme NO.	26		27				28			
	A	B	A	B	C	D	A	B	C	D
一次方案 Primary scheme										
电机功率KW Power consumption of motor	0.52-32	32-55	0.52-32	32-55	55-75		10-15	17-32	37-55	
单元额定电流A Unit rated current										
单元高度MM Unit height	240	480	240	480	640		400	480	640	
主要设备 Main electric apparatus	HFB TO B CJ20 T JR16 3UA		HFB HKB TO B CJ20 T JR16 3UA LMZ3-0.66				QSA HH15 B CJ20 T JR16 3UA LMZ3-0.66			
分断能力KA Breaking capacity	50						50			
用 途 Application	可逆 Inversion						Y-Δ			

表 3 (Table 3)

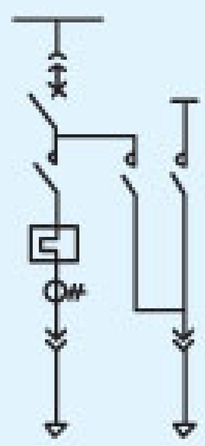
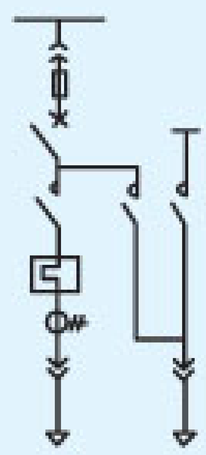
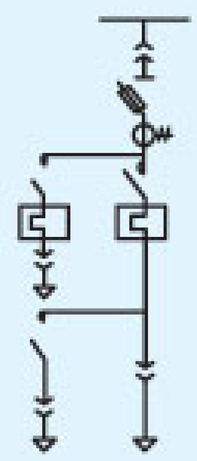
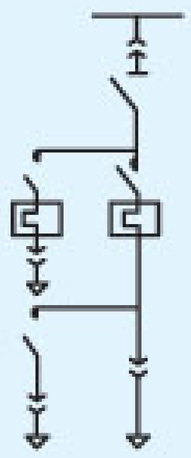
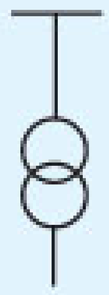
方案号 Scheme NO.	29				30				31	
	A	B	C	D	A	B	A	B	A	B
一次方案 Primary scheme										
电机功率KW Power consumption of motor	10-15	17-32	37-55		10-15	17-32	37-55		0.45-10	11-40
单元额定电流A Unit rated current										
单元高度MM Unit height	240	480	640		400	560	640		400	480
主要设备 Main electric apparatus	HFB HKB TO B CJ20 T JR16 3UA LMZ3-0.66				NT HFB HKB TO B CJ20 T JR16 3UA LMZ3-0.66				QSA HH15 B T JR16 3UA LMZ3-0.66	
分断能力KA Breaking capacity	50								50	
用 途 Application	Y-Δ								双速 Double speed	

表 3 (Table 3)

方案号 Scheme NO.	32	
	A	B
一次方案 Primary scheme		
电机功率KW Power consumption of motor	0.45-10	11-40
单元额定电流A Unit rated current		
单元高度MM Unit height	400	480
主要设备 Main electric apparatus	HFB TO B CJ20 T 3UA JR16	
分断能力KA Breaking capacity	50	
用 途 Application	双速 Double speed	

方案号 Scheme NO.	37		
	A	B	C
一次方案 Primary scheme			
变压器容量KAV	630	1000	1600
单元额定电流A Unit rated current			
外壳尺寸宽*深*高	2000*1500*2200	2200*1500*2200	2600*1800*2400
主要设备 Main electric apparatus	干式变压器 Dry type transformer		
分断能力KA Breaking capacity			
用 途 Application	变压器柜 Transformer cubicle		