

ZSII-12

铠装式金属封闭开关设备

Metal-clad and Metal-enclosed Switchgear



专业品质 追求卓越

The specialized quality pursue is remarkable



廈門國電龍源電力發展有限公司

Xiamen SP Longyuan Electric Power Development Co., Ltd.



ZSII-12

铠装式金属封闭开关设备

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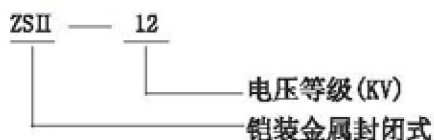
一、概述

ZSII-12型铠装式金属封闭开关设备（以下简称开关柜），适用于3~10kV三相交流50Hz单母线及单母线分段系统，主要用于发电厂、变电站及工矿企业、高层建筑的变配电中作为接受和分配电能之用，并对电路起到控制、保护和检测，满足GB、IEC\DIN等标准的要求，并具有先进可靠的五防闭锁功能。即可配用VD4真空断路器、3AE真空断路器、ZN48A真空断路器及VS1真空断路器，实为一种性能优越的配电装置。

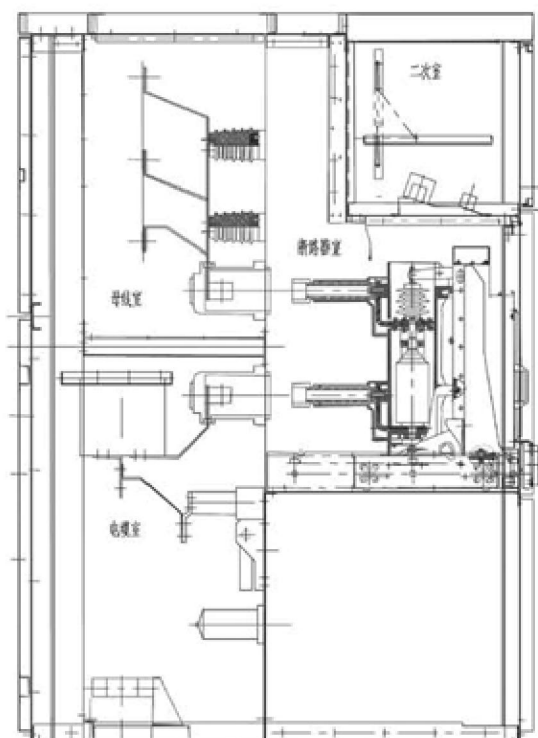
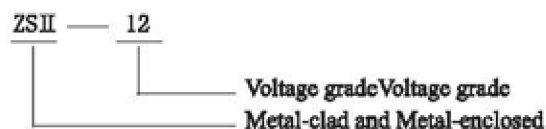
General

ZSII-12 Metal-clad and Metal-enclosed Switchgear (hereinafter referred to as the switchgear), widely applied in 3 ~ 10kV three-phase AC 50Hz single busbar electric power systems and single busbar electric sectionalized power systems, is mainly used in power plants, substation, industrial and mineral enterprises, high rises for control, protection, and inspection of electric circuits as well as for acceptance and distribution of electric power. The switchgear conform to GB, IEC, DIN and other standards, with advanced and reliable "five-prevention" function. The switchgear can be equipped with VD4 vacuum circuit breaker, 3AE vacuum circuit breaker, ZN48A vacuum circuit breaker and VS1 vacuum circuit breaker, is really an excellent distribution device.

二、型号含义



Type signification





三、工作环境条件

- 1、环境温度：-25℃~+40℃
 - 2、海拔高度：不高于2000m
 - 3、相对湿度：不大于90%（+25℃）
 - 4、地震烈度：不超过8度
 - 5、无火灾、爆炸的危险、严重污秽、化学腐蚀及剧烈震动的场所。
- 注：当实际使用环境条件与上述条件不同时，用户可与我厂协商。

Environmental conditions

- 1、Ambient temperature: -25℃~+40℃
 - 2、Altitude: ≤2000m
 - 3、Relative humidity: ≤90% (+25℃)
 - 4、Earthquake intensity: ≤8degree
 - 5、Away from the places of fire, explosion, dirt, chemical corrosives and strong vibration.
- NOTE: Please contact with us when the actual environmental conditions are different from above conditions.

四、开关柜的主要特点：

- 1、友好的人机界面使开关柜操作程序化、公式化，操作者一目了然。
The intelligent interface makes the operation more programmable and dear so that it is very convenient for operator to know every conditions of equipment.

Main characteristics



- 2、四销锁门结构解除了往常关门、开门操作繁琐的烦恼，无论何种状态，坚固可靠的门都能有效禁受内部故障电弧的冲击。
It is very convenient for operator to close and open the door with the special locking device. In any circumstances, it can withstand the impact caused by the arc of internal fault.



■ 门 door

- 3、设计独特的推进机构使手车在推进推出过程中能主动找位，一次隔离触头接触更可靠。
Unique propelling mechanism:
The truck is capable of finding its position automatically while pulling out or pushing in. The connection of the primary disconnecting contacts is more reliable.



■ 推进机构 propelling mechanism



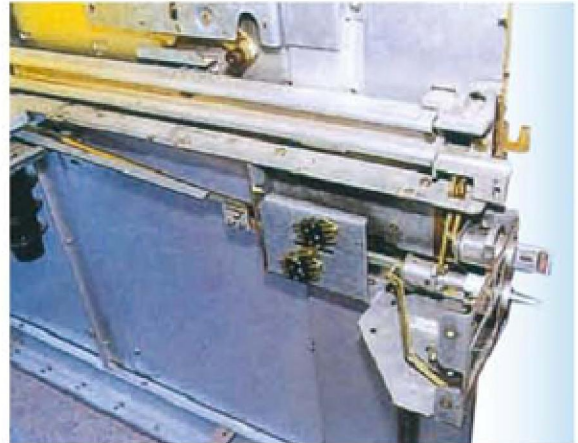
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4、接地联锁简单可靠

- a. 手车处于工作位置，接地开关操作选择旋钮被锁定，接地开关不能合上。
- b. 接地开关合闸，手车推进推出操作孔被遮挡，手车不能移动。
- c. 接地开关未合上，不能打开进入电缆室的后门检修电缆。

Simple and reliable earthing interlock

- a. When the truck is in "Service" position, the select button of earthing switch is locked and the earthing switch can't be closed.
- b. When the earthing switch is closed, the operating hole of truck is covered and the truck can be moved.
- c. If the earthing switch is not closed, the back door can not be opened for maintaining the cable compartment.



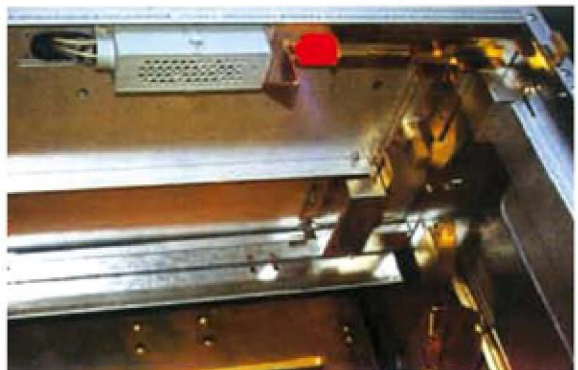
■ 接地联锁模块 Earthing interlock block

5、二次插头闭锁完全

- a. 不插上二次插头。断路器室门不能关闭，不能将断路器移到工作位置。
- b. 工作位置二次插头不能拔下。
- c. 断开位置，二次插头不拔下，断路器不能移开。

Entire interlock of secondary plug

- a. The door of CB compartment can't be closed and the CB can't be moved to "Service" position if the secondary is not inserted.
- b. If it is in "Service" position, the secondary plug can not be pulled out.
- c. If the truck is in "Disconnected" position, the secondary plug isn't be pulled out and the CB can't be drawn out.



■ 二次联锁 Secondary interlock

6、组合式活门开启灵活，随着断路器的拉出，活门自动关闭并强制闭锁，杜绝了误碰高压电的危险。

Flexible shutter:

The shutter will be automatically closed and locked mandatorily when the CB is drawn out so as to prevent contacting high voltage by mistake.



■ 活门 Shutter



- 7、CT安装由柜后立装改为吊装，增大了电缆室空间，电缆连接高度大于800mm，使维护简单，电缆安装方便。

The space of cable compartment is larger than before since the CT now is suspended in the cubicle. The connection height of cable is more than 800mm so that it is very convenient to install the cable.

- 8、坚固的柜体，有效的压力释放通道能禁受内部故障电弧冲击和灼烧，有效保障操作者人身安全。

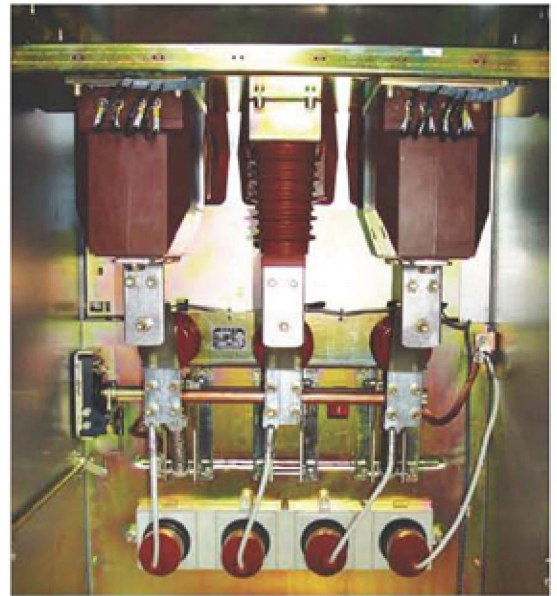
Because of the tight cubicle, the efficient pressure relief passage can withstand the impact and fire caused by the arc of internal fault so as to assure the safety of operator.

- 9、断路器室门与断路器有可靠的联锁，只有断路器室门关上，才能操作断路器，有效防止了关合故障电流时电弧冲出对人的伤害。

There is reliable interlock between the CB and the door. The CB can be operated only when the door of CB compartment is closed. It can effectively prevent doing harm to operator caused by arc while making fault current.

- 10、合理的电场分布和绝缘结构设计，使开关柜绝缘可靠，满足全工况要求。

It has the advantages of reasonable arrangement of electric field and insulating construction. This kind of design makes the switchgear more reliable and satisfying all kinds of requirements.



■ 电缆室 Cable compartment



■ 断路器室 Circuit breaker compartment



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五、主要技术参数 Specification

1、ZSII-12开关柜主要技术参数 Specifications of type switchgear

项目 Item	单位 Unit	数值 Data	
额定电压 Rated voltage	KV	12	
额定电流 Rated current	A	630, 1250, 1600, 2000, 2500, 3150, 4000	
额定频率 Rated frequency	HZ	50	
额定短路开断电流 Rated short-circuit breaking current	KA	20, 25, 31.5, 40, 50	
额定短路关合电流 Rated short-circuit making current	KA	50, 63, 80, 100, 125	
额定4S热稳定电流 Rated 4s short-time withstand current	KA	20, 25, 31.5, 40, 50	
1min工频耐受电压 1min power frequency withstand voltage	隔离断口 Contract-contract	KV	48
	相间及对地 Phase-phase and phase-earth	KV	42
雷电冲击耐受电压 Lightning impulse withstand voltage	隔离断口 Contract-contract	KV	85
	相间及对地 Phase-phase and phase-earth	KV	75
防护等级 Degree of protection		IP4X	

2、VD4真空断路器主要技术参数 Specifications of VD4 type VCB

项目 Item	单位 Unit	数值 Data	
额定电压 Rated voltage	KV	12	
额定电流 Rated current	A	630, 1250, 1600, 2000, 2500, 3150, 4000	
额定频率 Rated frequency	HZ	50	
额定短路开断电流(有效值) Rated short-circuit breaking current (effective value)	KA	25, 31.5, 40, 50	
额定短路关合电流 Rated short-circuit making current	KA	63, 80, 100, 125	
额定4S热稳定电流(有效值) Rated 4s short-time withstand current (effective value)	KA	25, 31.5, 40	
额定动稳定电流(峰值) Rated dynamic current (peak)	KA	63, 80, 100, 125	
1min工频耐受电压 1min power frequency withstand voltage	隔离断口 Contract-contract	KV	48
	对地 phase-earth	KV	42
雷电冲击耐受电压 Lightning impulse withstand voltage	隔离断口 Contract-contract	KV	85
	对地 phase-earth	KV	75
额定操作顺序 Rated operating sequence		分-0.3S-合分-180S-合分 O-0.3S-CO-180S-CO	



3、3AE真空断路器主要技术参数 Specifications of 3AE type VCB

项目 Item	单位 Unit	数值 Data	
额定电压 Rated voltage	KV	12	
额定电流 Rated current	A	630/800, 1250, 1600, 2000, 2500, 3150, 4000	
额定频率 Rated frequency	HZ	50	
额定短路开断电流 Rated short-circuit breaking current	KA	25, 31.5, 40	
额定短路关合电流 Rated short-circuit making	KV	63, 80, 110	
额定4S热稳定电流 Rated 4s short-time withstand current	KA	25, 31.5, 40	
额定绝缘水平 Rated insulation level	1min工频耐受电压 1min power frequency withstand voltage	KV	42
	雷电冲击耐受电压 Lightning impulse withstand voltage	KV	75
额定电容器组开合电流 Rated capacitor bank breaking current	A	630	
额定操作顺序 Rated operating sequence	分-0.3S-合分-180S-合分 ($\leq 1.5KA$) ; 分-180S-合分-180S-合分(40KA) O-0.3S-CO-180S-CO ($\leq 1.5KA$) ; O-180S-CO-180S-CO (40KA) ;		

4、VS1真空断路器主要技术参数 Specifications of VS1 type VCB

项目 Item	单位 Unit	数值 Data	
额定电压 Rated voltage	KV	12	
额定电流 Rated current	A	630, 1250, 1600, 2000, 2500, 3150, 4000	
额定频率 Rated frequency	HZ	50	
额定短路开断电流 Rated short-circuit breaking current	KA	16, 20, 25, 31.5, 40, 50	
额定短路关合电流 Rated short-circuit making current	KA	40, 50, 63, 80, 100, 125	
额定4S热稳定电流 Rated 4s short-time withstand current	KA	16, 20, 25, 31.5, 40, 50	
额定绝缘水平 Rated insulation level	1min工频耐受电压 1min power frequency withstand voltage	KV	42
	雷电冲击耐受电压 Lightning impulse withstand voltage	KV	75
额定峰值耐受电流 Rated peak withstand current	KA	63, 80, 100, 125	
额定操作顺序 Rated operating sequence	分-0.3S-合分-180S-合分 O-0.3S-CO-180S-CO		
机械寿命 Mechanical life	次	30000	
动静触头电磨损允许厚度 Contact erosion permission length	mm	3	
额定短路电流开断次数 Rated short circuit current breaking times	31.5KA及以下50次; 40KA为30次, 50KA为12次 50 times for 31.5kA and below; 30 times for 40KA; 12times for 50KA		



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5、ZN48A-12真空断路器主要技术参数 Specifications of ZN48A -12 VCB

项目 Item	单位 Unit	数值 Data	
额定电压 Rated voltage	KV	12	
额定电流 Rated current	A	630, 1250, 1600, 2000, 2500, 3150, 4000	
额定频率 Rated frequency	HZ	50	
额定短路开断电流 Rated short-circuit breaking current	KA	20, 25, 31.5, 40, 50	
额定短路关合电流 Rated short-circuit making current	KA	50, 63, 80, 100, 125	
额定4S热稳定电流 Rated 4s short-time withstand current	KA	20, 25, 31.5, 40, 50	
额定绝缘水平 Rated insulation level	1min工频耐受电压 1min power frequency withstand voltage	KV	42
	雷电冲击耐受电压 Lightning impulse withstand voltage	KV	75
额定峰值耐受电流 Rated peak withstand current	KA	50, 63, 80, 100, 125	
开断电流直流分量 D.C.component of breaking current		>35%	
额定单个电容器组开合电流 Rated single capacitor bank breaking current	A	630(800)	
额定背对背电容器组开合电流 Rated back-back capacitor bank breaking current	A	400(630)	
额定操作顺序 Rated operating sequence		分-0.3S-合分-180S-合分 O-0.3S-CO-180S-CO	
机械寿命 Mechanical life	次	20000	
动静触头电磨损允许厚度 Contact erosion permission length	mm	3	
额定短路电流开断次数 Rated short circuit current breaking times		31.5KA及以下50次；40KA及以上30次 50 times for 31.5KA and below; 30 times for 40KA and above	

六、开关柜一次单线图

1. 本表所列一次方案均为基础方案，接地开关、避雷器、带电显示器等元件的数量仅供参考，可根据用户设计要求增减。
2. 本表所列一次方案适合于12KV系统。
3. 开关柜之间的联锁方式用户自定。
4. 额定电流大于等于2000A时柜宽为1000mm，小于2000A时柜宽为800mm。
5. 配置SF6断路器，大于等于2000A时柜宽为900mm，小于2000A时柜宽为700mm。

The switchgear's primary circuit

- 1.The main circuit connection plan is the basic main circuit scheme,various apparatuses enumerated in scheme are for reference only.According to the requirement of clients,the earthing switch,the arrester,the charged display and the other apparatuses might be chosen.
- 2.The main circuit connection plan is suitable for the 12KV system.
- 3.Clients can choose the interlock versions between the switchgears.
- 4.For the panel's width,1000mm is suitable for the rated current of 2000A and above,800mm is suitable for the below.
- 5.If use the SF6 circuit breaker,900mm is suitable for the rated current of 2000A and above,700mm is suitable for below.



方案编号 Scheme Number		001	002	003	004	005
主接线方案 Main Circuit Scheme						
额定电流 (A) Rate current(A)		630-1600	630-1600	630-4000	630-1600	630-4000
主要设备 The apparatuses of maincircuit	断路器 (真空, SF6) Circuit Breaker(VCB, SF6)	1	1	1	1	1
	电流互感器 Current transformer	2(3)	2(3)	2(3)	2(3)	2(3)
	电压互感器 Voltage transformer		2(3)		2(3)	
	高压熔断器 High voltage fuse		3		3	
	接地开关 Earthing switch	1		1		
	避雷器 Arrester	3	3	3	3	
	带电显示装置 Charged display	1	1	1	1	
用途 Application	电缆进出线	电缆进出线	架空进出线	架空进出线	母线联络	
外形尺寸 (W×L×H) Overall dimensions	(700, 800, 900, 1000) × 1550×2300	(700, 800, 900, 1000) × 1550×2300	(700, 800, 900, 1000) × 1550×2300	(700, 800, 900, 1000) × 1550×2300	(700, 800, 900, 1000) × 1550×2300	

方案编号 Scheme Number		006	007	008	009	010
主接线方案 Main Circuit Scheme						
额定电流 (A) Rate current (A)		630-4000	630-4000	630-4000	630-4000	
主要设备 The apparatuses of maincircuit	断路器 (真空, SF6) Circuit Breaker(VCB, SF6)	1				
	电流互感器 Current transformer	2(3)	2(3)	2(3)	2(3)	2(3)
	电压互感器 Voltage transformer		2(3)	2(3)	2(3)	
	高压熔断器 High voltage fuse		3	3	3	3
	接地开关 Earthing switch	1				
	避雷器 Arrester					3
	带电显示装置 Charged display	1				
用途 Application	母线联络	专用计量	专用计量	专用计量	电压测量	
外形尺寸 (W×L×H) Overall dimensions	(700, 800, 900, 1000) × 1550×2300	800×900 1550×2300	800×900 1550×2300	800×900 1550×2300	800×900 1550×2300	



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一次方案图

方案编号 Scheme Number		011	012	013	014	015
主接线方案 Main Circuit Scheme						
额定电流 (A) Rate current(A)				630-1000	630-1000	630-1000
主要设备 The apparatuses of maincircuit	断路器 (真空, SF6) Circuit Breaker(VCB, SF6)					
	电流互感器 Current transformer					
	电压互感器 Voltage transformer	2(3)	JDZJ(3)			
	高压熔断器 High voltage fuse		3			
	接地开关 Earthing switch					
	避雷器 Arrester		3			
	带电显示装置 Charged display					
用途 Application	电压测量	隔线用引线柜	隔线用引线柜	隔线用引线柜	隔线用引线柜	
外形尺寸 (W×L×H) Overall dimensions	800×1550×2300	1000×1550×2300	(800, 1000)×1550×2300	(800, 1000)×1550×2300	(800, 1000)×1550×2300	

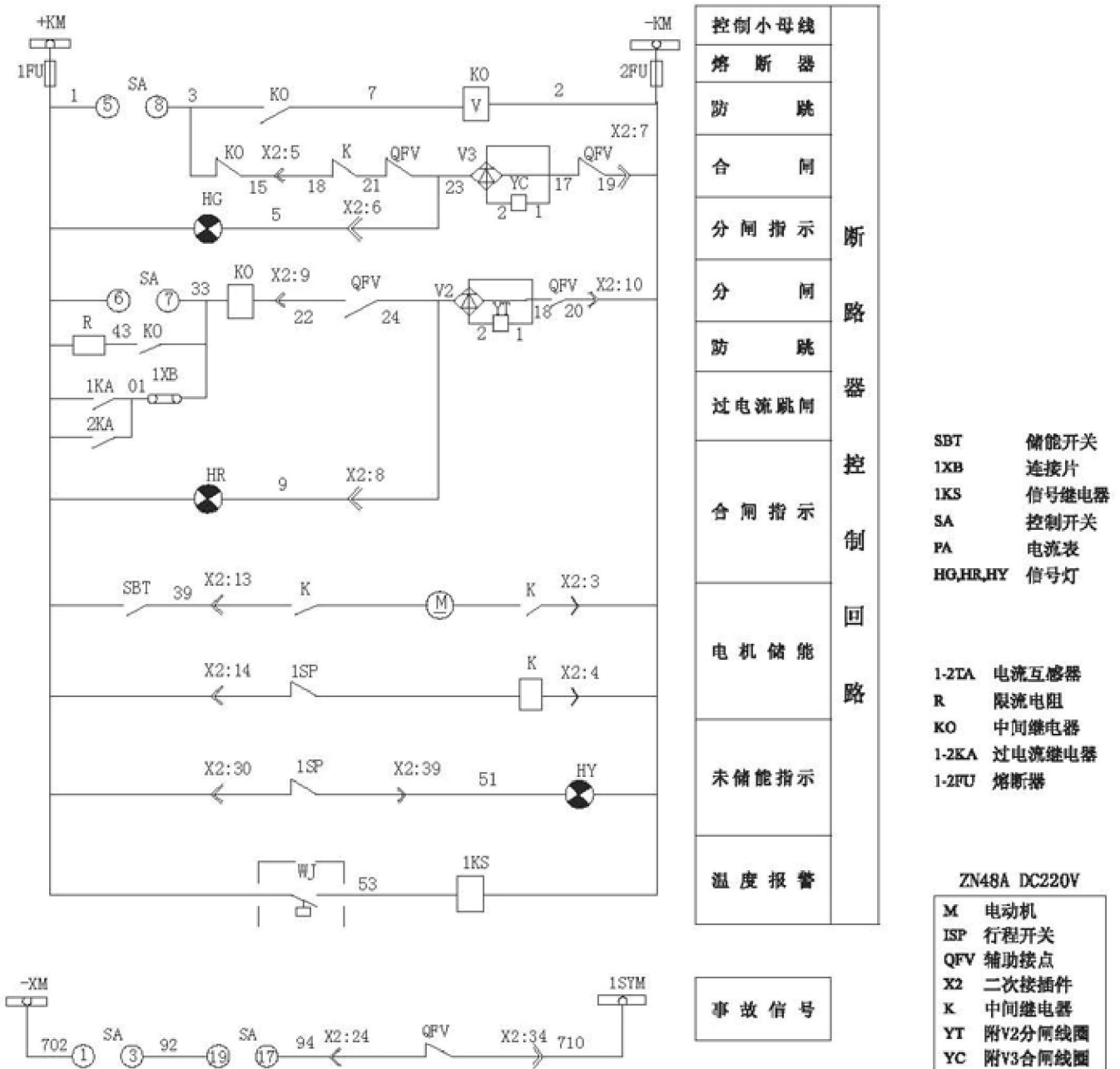
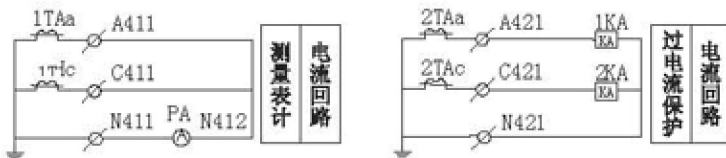
方案编号 Scheme Number		016	017	018	019	020
主接线方案 Main Circuit Scheme						
额定电流 (A) Rate current(A)						
主要设备 The apparatuses of maincircuit	断路器 (真空, SF6) Circuit Breaker(VCB, SF6)	变压器1台 (80KVA)				
	电流互感器 Current transformer					
	电压互感器 Voltage transformer					
	高压熔断器 High voltage fuse	3				
	接地开关 Earthing switch					
	避雷器 Arrester					
带电显示装置 Charged display						
用途 Application	电缆进出线					
外形尺寸 (W×L×H) Overall dimensions	1200×1550×2300					



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七、典型二次回路控制图 The secondary circuit diagram

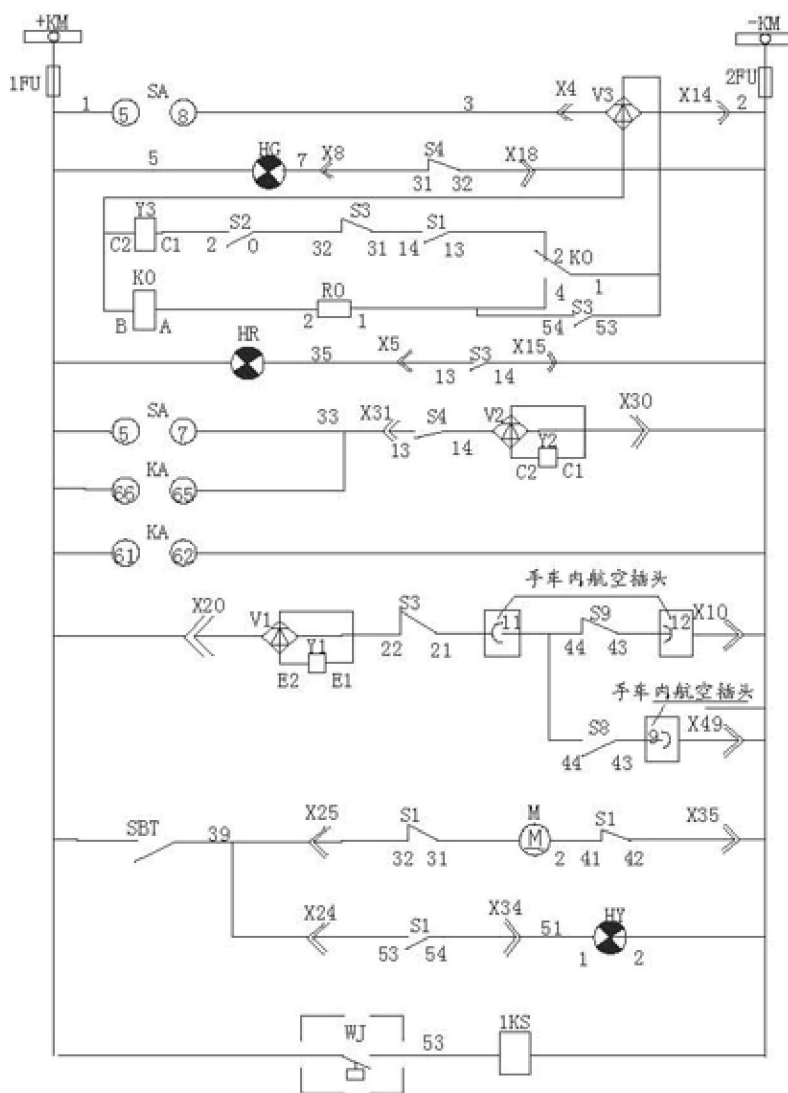
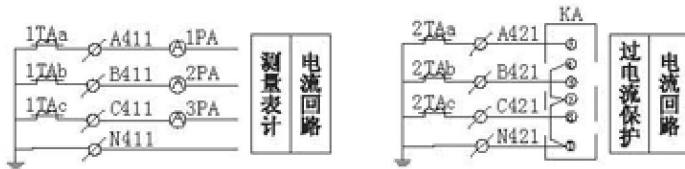
馈线二次方案A





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馈线二次方案C

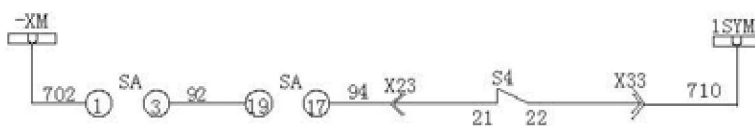


控制小母线
熔断器
合闸
跳闸指示
合闸
防跳
合闸指示
跳闸
过电流跳闸
辅助电源
工作位置
试验位置
电机储能
储能指示
温度报警

- 电流互感器 1-2TA
- 控制开关 SA
- 组合式继电器 KA
- 交流电流表 1-3PA
- 储能开关 SBT
- 信号灯 HG,HR,HY
- 信号继电器 1KS
- 熔断器 1-2FU

VD4真空断路器内设备

- M 储能电机
- V1-V3 整流桥
- Y3 合闸脱扣器
- Y2 第一闸分脱扣器
- Y1 合闸闭锁电磁铁
- RO 电阻
- S8 实验位置行程开关
- KO 防跳继电器
- S2 合闸闭锁辅助开关
- S1 与储能相关辅助开关
- S3 S4 与主轴相关辅助开关
- S9 工作行程开关

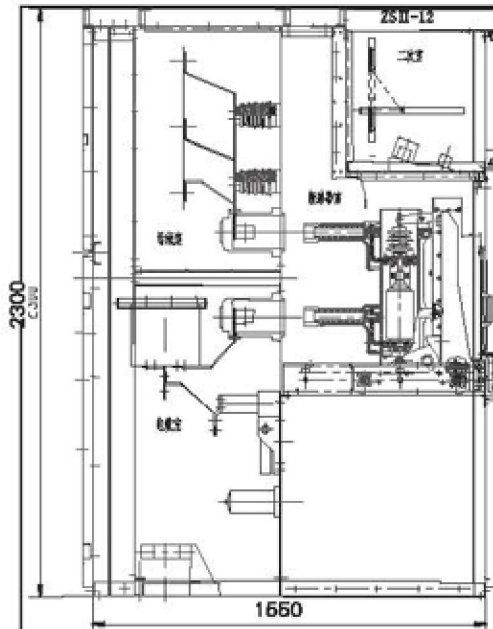




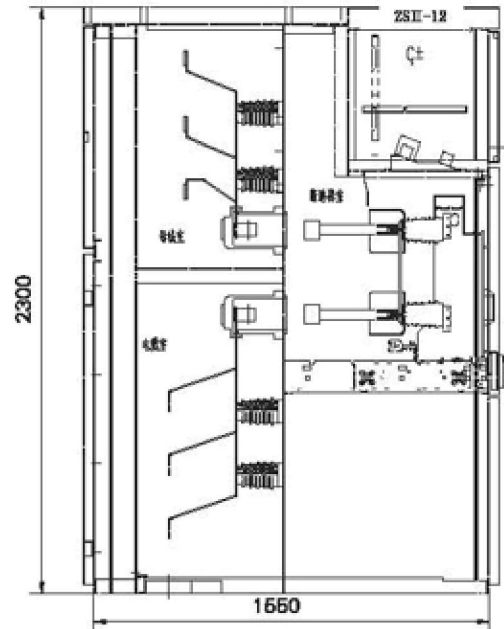
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八、常用开关柜结构示意图 The Typical Construction Layout

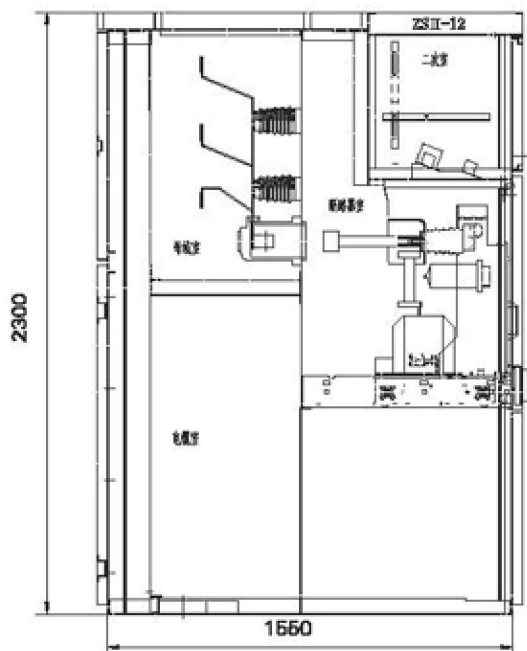
1、进出线柜 Incoming/Feeder panel



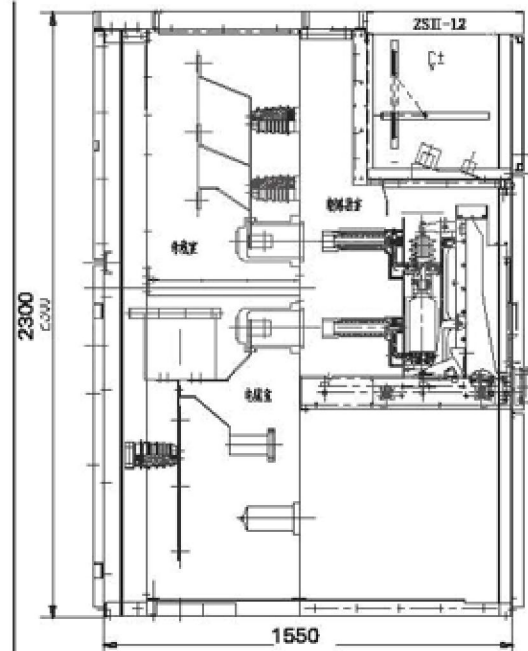
2、隔离柜 Disconnecting panel



3、PT柜 PT panel



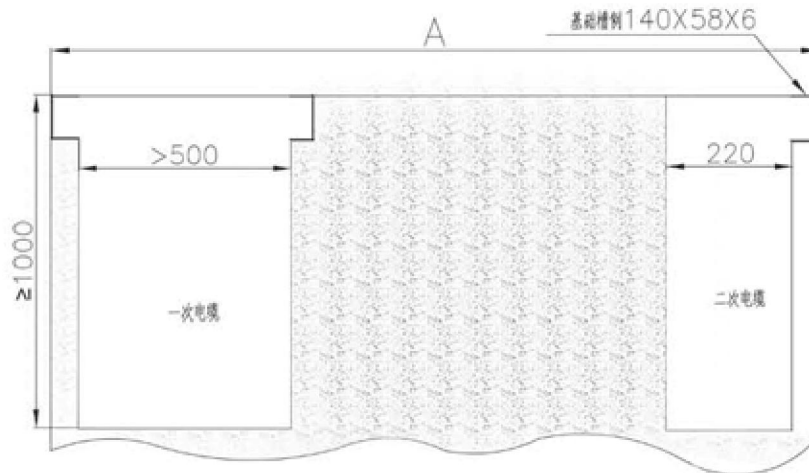
4、母联柜 Bus coupling panel





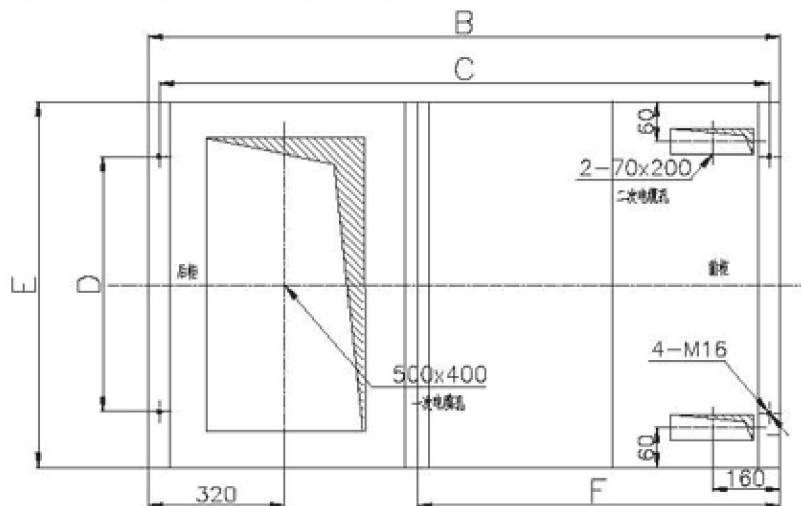
九、开关柜设备安装图 The Installing Drawing

安装地基参考图 Installing drawing of plinth



- 1、二次浇灌的基础槽钢可以反扣。
- 1、The basis channel steel of the second can be left-hand installed.
- 2、开关柜固定在槽钢上允许焊接。
- 2、When fix the switchgear to the channel steel, allow to be welded.

开关柜底框开孔图 The switchgear's anchoring drawing



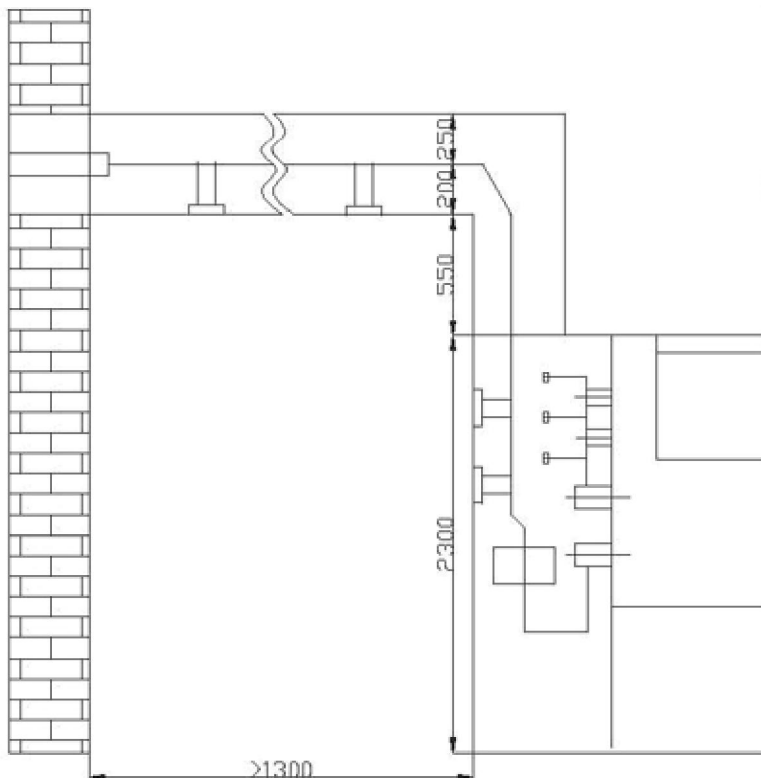
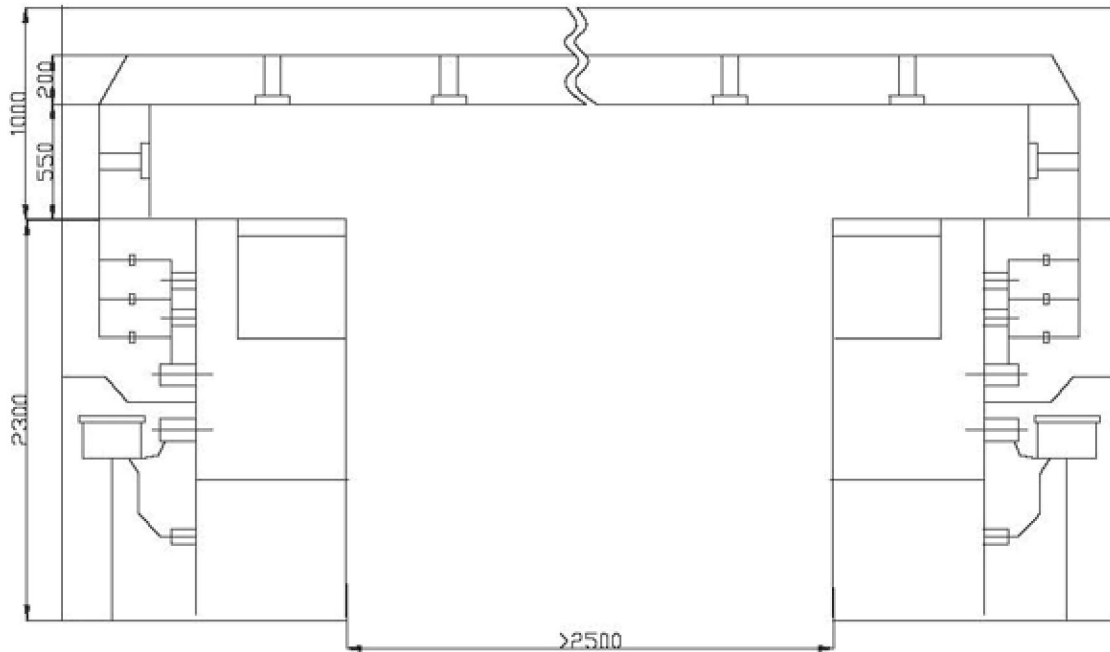
开关柜外形尺寸图 The switchgear's overall dimensions

产品型号	尺寸	A	B	C	D	E	F	柜体外形尺寸
ZSII-12	1550	1550	1500	600	700 (800, 900, 1000)	800	700 (800, 900, 1000) × 1500 × 2300	
	1950	1950	1900	600	700 (800, 900, 1000)	800	700 (800, 900, 1000) × 1950 × 2300	
	1550	1550	1500	1000	1200	800	1200 × 1550 × 2300	



ZSII-12 铠装式金属封闭开关设备

12KV开关柜母线桥布置示意图 The switchgear's bushbar tray drawing



注:

桥架布置图仅作为典型示意图，
仅供参考；针对具体项目，根据
客户要求，适当调整相关尺寸。

Note:

The busbar tray just as a typical
schematic layout for reference
purposes only; for specific projects,
adjust the related size according
to customer's requirements.



十、订货须知 Ordering notice

ZSII开关设备订货时应提供下列技术资料:

- 1、主接线方案图编号、用途和单线系统图；额定电压；额定电流；额定短路开断电流；配电室平面布置及开关设备的排列配置图等。
- 2、标明进/出线电缆的规格。
- 3、开关设备控制、测量及保护功能的要求以及其他闭锁和自动装置的要求。
- 4、开关设备主要电气元件的型号、规格及数量。
- 5、如开关设备之间或进线柜需要母线桥连接，应提供母线桥的额定载流量，母线桥的跨度，距地高度等具体要求数据。
- 6、开关设备使用在特殊环境条件时，应在订货时详细说明。
- 7、其它特殊要求。

ZSII switchgear's order shall provide the following technical data:

- 1、The scheme number and the application of the main circuit scheme;the primary circuit;the rated voltage; the rated current; the rated short-circuit breaking current; the layout of distribution room; and the layout of the switchgear.
- 2、Indicate the specifications of the import and outlet cable .
- 3、The requirements of switchgear's control, measurement and protection ,and the other requirements of locking and automatic devices.
- 4、The type,specifications and quantity of the main electrical components.
- 5、If the switchgear need to connect by busbar tray, should provide the rated carrying capacity ,the bus bridge span, the height from the ground and so on.
- 6、If the switchgear is used in special environmental conditions ,the environmental conditions should be explained in detail .
- 7、The other special requirements.

驻外机构



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