

Smart Unit+

智能移开式金属封闭开关设备

Intelligent Withdrawable
Metal-enclosed Switchgear

智能电气专家
服务中国电力

Intelligent Electric Experts
Service China Electric Power



ALSBURG

阿斯博开关

ALSBURG

源自德国 电气精品

Quality Electrical from Germany

Smart Unit+

Smart Unit+ 智能智能移开式金属封闭开关柜核心技术源自德国，系德国ALSBURG公司为满足中国电力市场对高品质、环保型开关柜的需求，而推出的新一代开关柜。



公司简介
Company Profile



智能开关
Intelligent Switch



中压生产
Medium Pressure Production

Smart Unit+ Solid Insulated Switchgear core technology from Germany, Department of German ALSBURG company introduced a new generation to meet the electricity market demand for high-quality, environmentally friendly RMU.

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- 德国阿斯博荣誉产品，品质卓越。
- 适合未来电网对产品技术可靠性和绿色环保的发展趋势。
- 新一代12kV小型化手车柜。

Honorable product from Alsburge with premium quality.

For future grid reliability of product technology and green trends.

A new generation of 12 kV intelligent withdrawable metal-enclosed switchgear.

新一代开关柜

Smart Unit+智能移开式金属封闭开关柜核心技术源自德国，系德国ALSBURG公司为满足中国电力市场对高品质、环保型开关柜的需求，而推出的新一代开关柜。

Smart Unit+智能移开式金属封闭开关柜是一种集外固封、绝缘母线及组合单元小型化三种技术于一体，开关及高压带电部件采用可回收塑料进行整体浇注，以可回收塑料固封作为带电体相对地、相间绝缘的新型配电设备。

阿斯博公司设计生产的Smart Unit+智能移开式金属封闭开关柜所使用的材料全部选用可回收性、无污染的固体材料，包括一次带电体的绝缘和开关灭弧的实现，不会排放任何有毒物质，更没有任何气体释放到大气中，无漏气爆炸和内部燃弧的隐患，其具有绝缘性能高、体积小、整体强度高、免维护等技术特点，实现了真正意义上的零排放、零污染的绿色环保产品。

A new generation of Switchgear

Smart Unit+ intelligent withdrawable metal-enclosed switchgear core technology from Germany, Department of German ALSBURG company insulated a new generation to meet the electricity market demand for high-quality, environmentally friendly Switchgear.

Smart Unit+ intelligent withdrawable metal-enclosed switchgear is a set of the outer solid seal, insulated bus and combination unit miniaturization three technologies in one, switches and high-voltage live parts with epoxy resin for the whole cast, solid epoxy resin sealed as a charged body. In contrast, has insulation new distribution equipment.

The company designed and manufactured in A Sibor Smart Unit+ intelligent withdrawable metal-enclosed switchgear materials used in all the selected recyclable, pollution-free solid materials, including a charged body insulation and the realization of the switch interrupter, do not emit any toxic substances, no gas is released into the atmosphere, no hidden leak explosion and internal arcing, which has a high insulation performance, small size, high overall strength, maintenance-free technical characteristics, to achieve a true sense of the zero-emission, zero pollution green products.

试验

Smart Unit+智能移开式金属封闭开关柜已经通过以下的各种试验，可以确保其在正常使用条件下安全运行。

- 型式试验：绝缘试验、温升、短时和峰值耐受电流、短路电流开断能力和短路关合能力、电缆充电电流、防护等级、电寿命和内部燃弧试验，以及固体绝缘组件的环境试验。
- 出厂试验：机械特性测试、主回路min工频耐压试验、辅助回路工频耐压试验、主回路电阻测试、联锁试验、固封组件局部放电测量，以及机械和电气操作试验。

Test

Smart Unit+ intelligent withdrawable metal-enclosed switchgear has passed the following test. To ensure safe operation under normal conditions of use.

- Type test, insulation test, temperature rise, short-term tolerance and peak current, short circuit current, open circuit and short circuit close, cable charging current, protection grade, electrical endurance and internal arc test, and environmental testing of solid insulation component.
- Routine tests: mechanical property test, main circuit power frequency withstand voltage test, auxiliary circuit power frequency withstand voltage test, main circuit resistance test, interlock test, sealing components, partial discharge measurement, as well as mechanical and electrical operation test.

应用场合

- Smart Unit+智能移开式金属封闭开关柜是阿斯博公司为适合未来电网对产品技术可靠性和绿色环保的发展趋势，而推出的全新一代开关柜，其具有高水平的运行安全性，系SF6开关柜的完美替代解决方案，适应于智能电网应用，可广泛应用于12kV二次配电系统，用于中压电缆线路的分段、联络及分接负荷；并且该系统具有灵活、完备的解决方案，用户可根据使用需要进行任意方案的组合和选型。

Applications

- Smart Unit+ intelligent withdrawable metal-enclosed switchgear ALSBURG for future power grid technology of product reliability and the development trend of environmental protection, green environment and a new generation of ring net cabinet, it has a high level of safety, perfect instead of SF6 ring main unit cabinet solution, suitable for smart grid applications, can be widely applied to 12 kv secondary distribution system, used in medium voltage cable line section, liaison, and tap the load; And the system has a flexible, complete solution, users can be used according to need to undertake any project combination and selection.

主要应用场所

- 二次配电系统，用户变电站，电力系统和公用设施的变电站和开关站
- 二次变电站
- 工矿企业
- 数据中心
- 高层建筑
- 风力发电
- 中小型发电站
- 机场
- 商场
- 污水处理
- 地铁
- 应急供电系统

Main applications

- Secondary power distribution systems, users; substations, power systems and substations and switching stations of public utilities
- Secondary substations
- Industrial and mining enterprises
- Data center
- High-rise buildings
- Wind power generation
- Small and medium-sized power stations
- Airports
- Stores
- Sewage treatment
- Subway
- Emergency power supply systems



开关柜用固体绝缘母线系统
Solid isolated bus system for switchgear



固体绝缘的断路器与
隔离开关的组合电器
Combined electrical apparatus of
solid insulated circuit breaker and
isolating switch

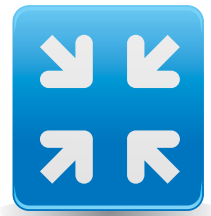
绿色
环保
Green



SEG所使用材料全部为可回收无污染环保材料，避免了目前在开关柜中普遍使用的SF6气体对环境的威胁和破坏。

SEG materials used all recyclable non-polluting environmentally friendly materials, to avoid the widespread use of SF6 gas in the RMU threats to the environment and destruction.

简洁
紧凑
Simple
and
Compact



同类开关柜产品中体积最小的产品之一，因此在新建变电站和改造项目中能带来突出的经济效益。

Similar RMU smallest one of the products in new substations and renovation projects can bring outstanding value for money.

特殊
应用
Special
Applications



安全
可靠
Safe and
Reliable



全封闭金属外壳，相对地和相间采用环氧树脂和硅橡胶实现全绝缘，防护等级IP67；方便查看隔离断口，确保运行人员操作安全；无压力元件，无需泄漏检测等运行安保措施。

Fully enclosed metal shell, and phase using epoxy resin and silicone rubber to achieve full insulation, protection class IP67; easy viewing isolated fracture ensure the operational safety of the operating personnel; pressure element, without leakage detection run security measures.

智能
Intelligent



具备配网各种自动化运行保护装置、以及确保设备安全运行的在线监测装置，确保SEG可以在全自动化电力网络中安全运行。

With a variety of automated distribution network run protection device, as well as to ensure the safe operation of equipment on-line monitoring device to make sure that the SEG can run fully automated power network security.

可以安全运行于高海拔、盐雾潮湿、低温寒冷、安全防爆或者高环保要求的各种特殊使用场所。

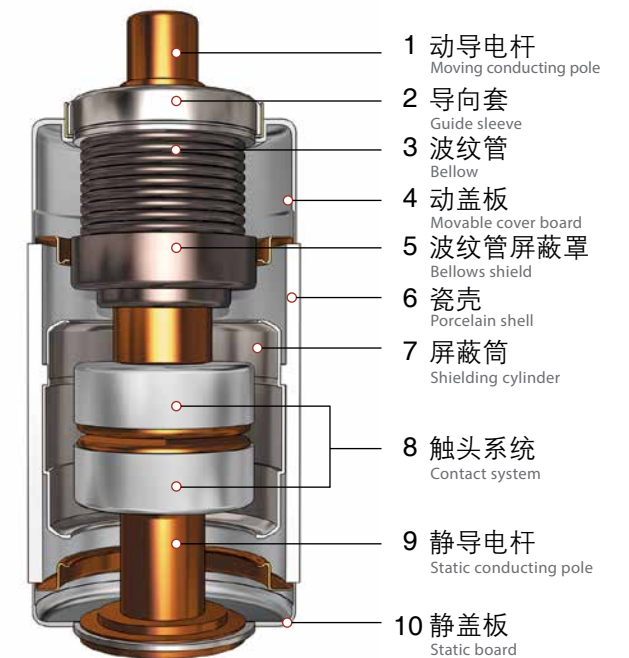
Safe operation in high altitude, salt spray wet, low temperature cold, safety explosion-proof or advanced high environmental requirements of various special place.

真空技术特点

- Smart Unit+智能移开式金属封闭开关柜选用的断路器或真空负荷开关的灭弧介质选用真空介质，采用固封式真空灭弧室。
- 独特的纵磁R触头电场优化设计；
- 分断短路电流能力强、重燃率低、可靠性高；
- 完全一次封排工艺；
- 高稳定质量的陶瓷金属化工艺；
- 不锈钢直接钎焊工艺。

Vacuum Technology Characteristics

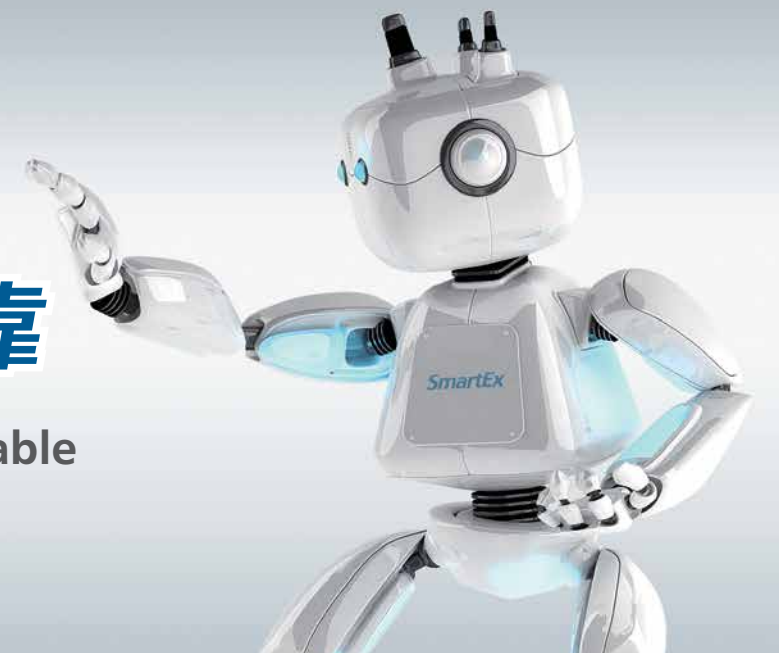
- Vacuum circuit breaker arcing medium vacuum load switch medium, using solid sealing vacuum arcing.
- Unique electric field optimization design with longitudinal magnetic R contact.
- Strong capacity of breaking short-circuit current, low rate of reignition and high reliability.
- One-time seal-exhaust process.
- Ceramic metallization process of high and stable quality.
- Direct welding process of stainless steel.

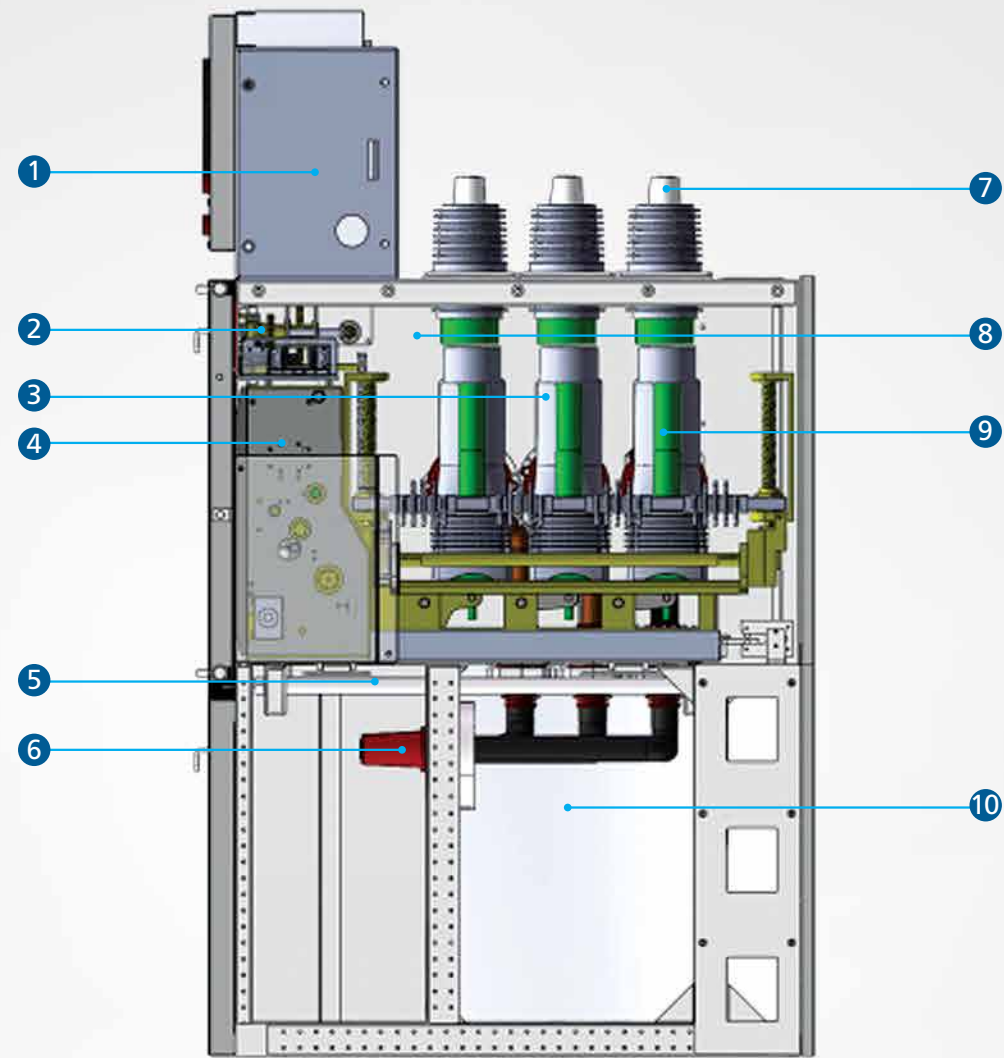


真空灭弧室剖视图
Vacuum Arcing Cutaway View

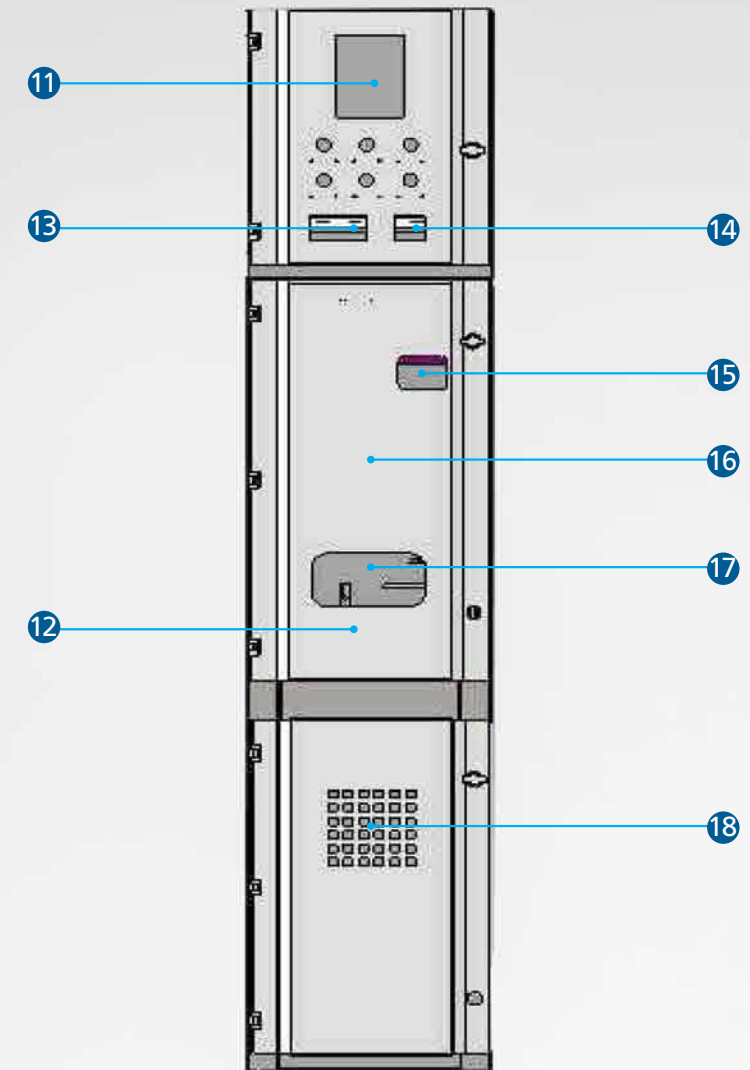
绿色环保
安全可靠

Green Safe and Reliable

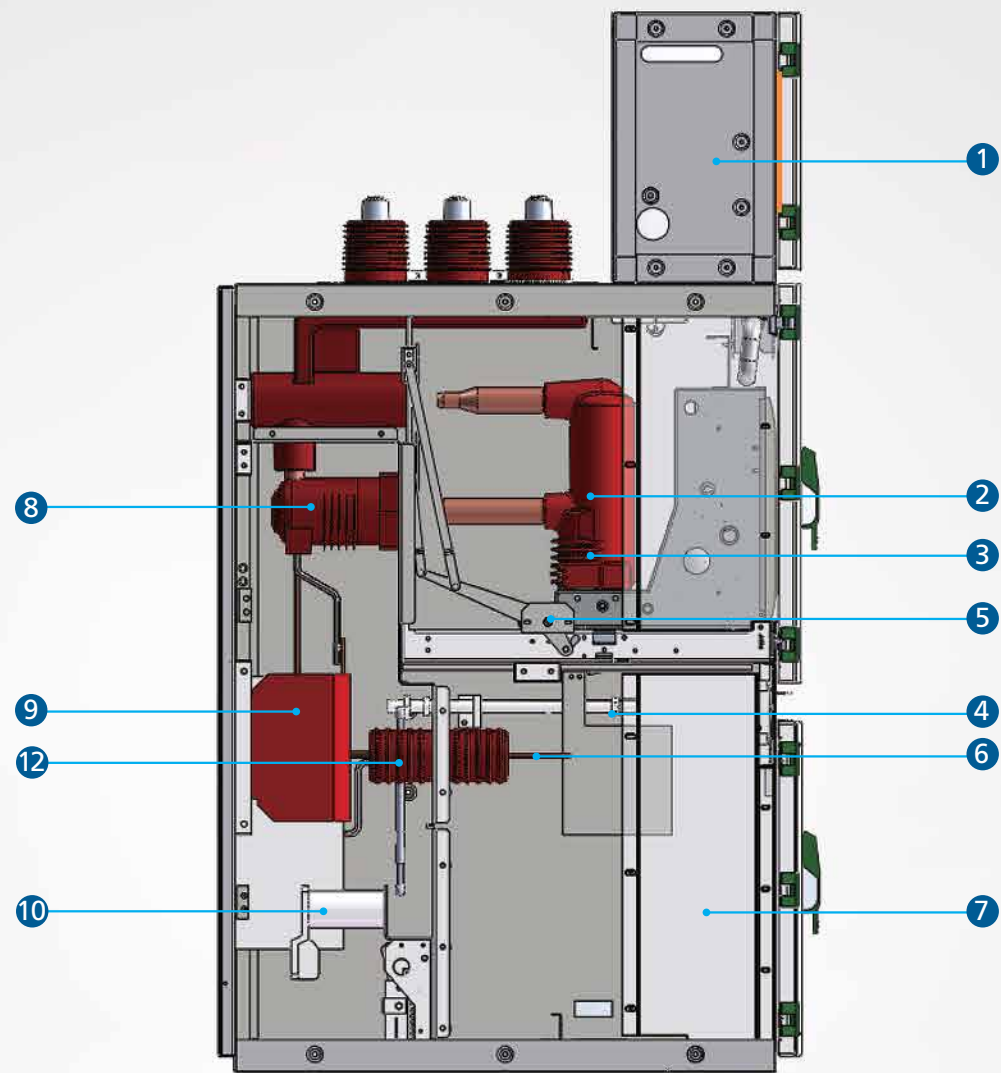




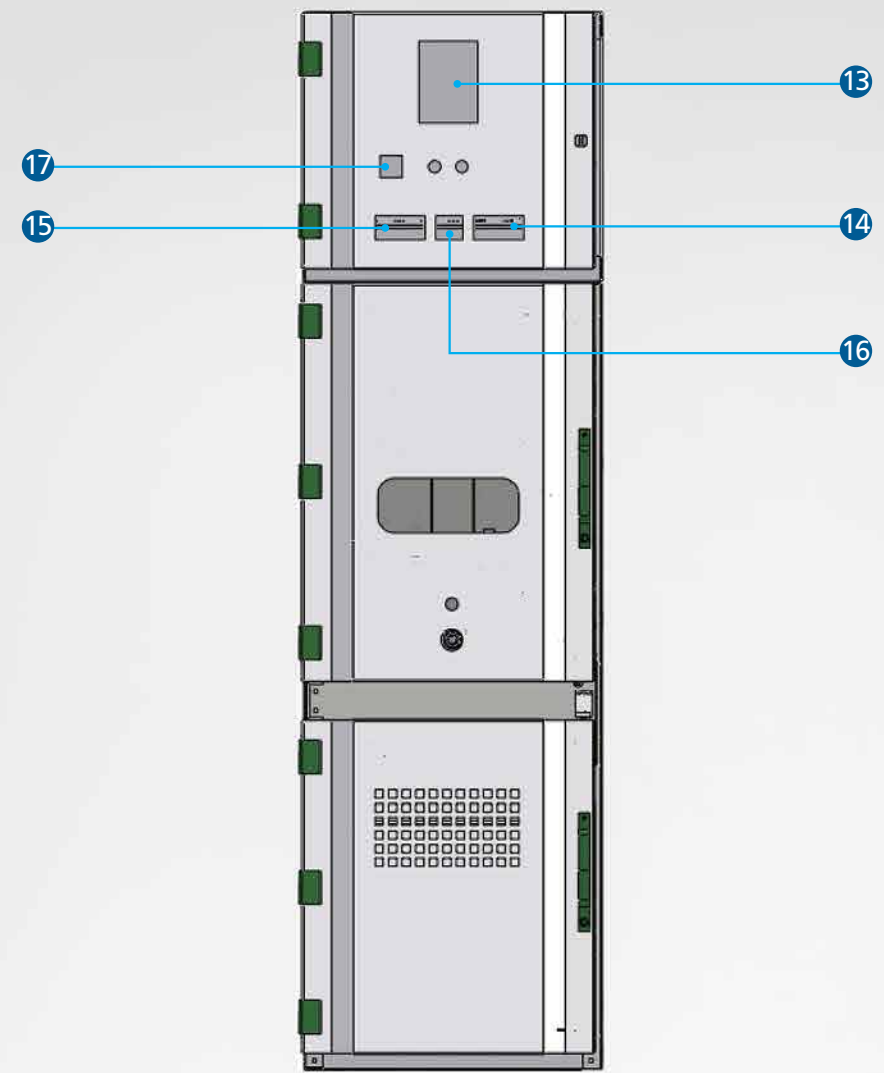
- | | |
|--|---|
| ① 低压室单元
Low pressure room unit | ⑥ 用于插入式连接电缆头套管
Insert type connection cable head insulator |
| ② 隔离刀操作机构
Isolation knife operating mechanism | ⑦ 母线
Bus bar |
| ③ 真空灭弧室
Vacuum interrupter | ⑧ 断路器室单元
Breaker room unit |
| ④ 断路器操作机构
Breaker operating mechanism | ⑨ 隔离刀
Isolation knife |
| ⑤ 操作轴
Operating shaft | |



- | | |
|---|--|
| ⑩ 电缆室单元
Cable vault unit | ⑮ 隔离刀头观察窗
observation window of isolated knife head |
| ⑪ 综合保护装置
Protective device | ⑯ 模拟牌
Simulation card |
| ⑫ 铭牌
Nameplate | ⑰ 断路器合分指示观察窗
observation window of breaker closing and opening indication |
| ⑬ 带电显示装置
Presence indicating device | ⑱ 电缆观察窗
observation window of cable |
| ⑭ 温湿度控制器
Temperature and humidity controller | |



- ① 低压室单元
Low pressure room unit
- ② 真空灭弧室
Vacuum interrupter
- ③ 断路器操作机构
Breaker operating mechanism
- ④ 接地开关操作轴
Operating shaft of grounding switch
- ⑤ 提门机构
Lifting mechanism
- ⑥ 电缆接口
Cable interface
- ⑦ 二次线护板
Secondary line guard board
- ⑧ 触头盒
Contact box
- ⑨ 电流互感器
Current transformer
- ⑩ 接地开关
Grounding switch



- ⑪ 绝缘件
Insulation
- ⑫ 穿墙套管
Wall bushing
- ⑬ 综合保护装置
Protective device
- ⑭ 带电显示装置
Presence indicating device
- ⑮ 故障指示装置
Fault indicating device
- ⑯ 温湿度控制器
Temperature and humidity controller
- ⑰ 转换开关
Transfer switch



Smart Uint+ 手车移动式开关柜（V柜方案）
Smart Unit+ solid insulated switchgear (V cabinet scheme)



Smart Uint+ 手车移动式开关柜（V柜方案）
Smart Unit+ solid insulated switchgear (V cabinet scheme)



断路器-隔离刀组合电器

Combined electrical apparatus of circuit breaker and knife isolating switch



真空断路器

Vacuum circuit breaker

设计新颖

- 整个母线和电缆侧都固定在柜体中，设备中能动作的只有侧装手车式断路器。这样每个单元互不干涉，侧装手车式断路器也能抽出柜体，柜体门板可用作检修平台，检修方便。
- 模块化设计：
 - ① 400mm宽600mm高的开关室，600mm高的电缆室即可组成基本用电单元；
 - ② 可根据需要配备400mm宽×400mm高的仪表箱
- 绝缘方式：
 - ① 采用固体绝缘与空气绝缘相结合的方式；
 - ② 隔离断口部分采用空气绝缘，三相断口清晰可见；
 - ③ 断路器部分采用固体绝缘的方式
- 连接方式：
 - ① 与主母线接触采用隔离刀头升降式的方式；
 - ② 与电缆侧接触采用左右移开式方式
- 可选择密封箱体设计方案，所有一次带电部分及主要机构完全密封在金属密封箱体中。

Novel design

- The whole bus and the cable side is fixed on the cabinet body, only the side-mounted handcart type circuit breaker can action in the device. So that each unit does not interfere with each other and the side-mounted handcart type circuit breaker can draw out of cabinet. The cabinet door can be used as a maintenance platform and is convenient for maintenance.
- Modular design:
 - ① The basic unit of electricity is made up of 400mm wide 600mm high switch room and 600mm high cable vault
 - ② According to the requirement, it's can equipped with a instrument box which is 400mm wide *400mm high
- Insulation
 - ① Adopting a combination of solid insulation and air insulation;
 - ② The isolating fracture uses air insulation and the fracture of three-phase clearly visible;
 - ③ The part of circuit breaker adopts the way of solid insulation
- Connection
 - ① It adopts the way of isolation knife head lift type to contact main bus-bar
 - ② It adopts the way of left and right shift to contact the side of cable
- The sealed box design is adopted. All primary live part and the main mechanisms are fully sealed in the metal sealed box.

安全可靠

- 由于可触摸部位采用了屏蔽措施，杜绝了人身触电事故的发生。提高了安全使用性。完善的联锁互锁系统，三相隔离断口清晰可见。避免了误操作事故的发生。完全取消了SF6气体的应用，避免了SF6环网柜因气体压力不足造成绝缘性能和灭弧能力下降引发爆炸事故。强化相间隔离结构。避免相间或多回路短路而扩大或引发爆炸事故。采用具有防爆性能的真空灭弧室，开关套筒对开关具有进一步防护性能。
- 具有多种机械及电气联锁，满足国家标准对产品“五防”联锁的要求，防止操作人员误操作，保障产品安全、可靠的运行。
- 采用计算机优化设计，防内部燃弧理念，在位于柜体后下部专门设计的泄压盖板压力释放通道，一旦发生内部燃弧，可通过泄压通道引导内部燃弧泄压，为操作人员提供最大的安全性保障，并且尽可能地控制故障影响范围。

绿色环保

- 产品制造中所选用的材料全部是无毒无害物质，使用中也不会排出任何有毒有害物质，材料经寿命周期后可以再回收利用，决定了使用的环保性。

功能齐全

- 方案系列化完整，用户可根据选型需要，任意灵活地进行组合。
- 柜体结构设计紧凑，整机外形尺寸小，安装占地面积小，并且非常方便进行安装和维护。

智能组件

- 可选配确保电气设备安全运行的在线监测装置，实时反映开关设备的运行状态。

Safe and reliable

- Due to the touch area uses shielding measures, which prevent the occurrence of personal electric shock accident and improve the safety in use. Perfect interlock interlocking system, three-phase isolation fracture clearly visible. To avoid the misuse of the accident, it abolished the application of SF6 gas which avoid explosion accident of SF6 ring network cabinets due to insufficient gas pressure cause the decline of insulation performance and arc extinguishing ability. It enhanced phase separation structure and avoided phase to phase or multi-loop short circuit to expand or cause explosion accident. The vacuum interrupter with explosion-proof function is adopted, and switch sleeve has further protection performance on switch.
- Several types of mechanical and electrical interlocks satisfy the national requirements on "five-prevention" interlock of products, and prevent misoperation by operators, and ensure product safety and reliable operation.
- The idea of internal arcing prevention with computer optimized design is adopted, located in the specially designed pressure relief cover plate pressure release channel at the bottom of the cabinet. Once internal arching occurs, guide internal arcing pressure relief through pressure relief channel, providing maximum safety guarantee for the operators and controlling fault influence range as far as possible.

Green environmental protection

- All materials used in the manufacture of products are non hazardous, and the use of which will not discharge any poisonous and harmful substances. Materials can be recycled after life cycle, which determine the use of environmental protection.

Full functioning

- The scheme has complete series. Users can combine flexibly at will according to type selection demand.
- The cabinet structure is of compact design. The outline dimension of the complete machine is small, and installation floor area is small, and installation and maintenance are very convenient.

intelligent component

- On line monitoring device for the safe operation of electrical equipment is adopted, which can reflect the running state of the switch gear in real time.

技术参数

Technical Parameters

正常使用环境条件

Normal ambient condition

环境温度 / Ambient temperature

最高温度 / Maximum temperature : + 45℃

最低温度 / Minimum temperature : - 45℃

环境湿度

Ambient humidity

最大平均相对湿度 / Maximum average relative humidity

日平均相对湿度 / Daily mean relative humidity : ≤95%

月平均相对湿度 / Monthly mean relative humidity : ≤90%

海拔高度

≤3000米/ m

Height above sea level

抗震能力

≤8度/ magnitude

Seismic resistant capacity

浸水试验

Submerging test

水下施加 / Applied underwater : 0.3bar, 12kV24小时 / hours

防护等级

Protection class

固体绝缘系统 / Solid insulation system : IP67

开关柜外壳 / Switchgear enclosure : IP3X

特殊工作条件

Special working conditions

当使用环境为高海拔、高湿度等其他特殊环境条件时，请与公司协商相关的制造技术。

In case of special working conditions such as high altitude, high humidity and others, please negotiate with the company on relevant manufacturing technology.

技术标准

Technical Standards

Smart Unit+ 产品设计主要遵循的标准如下：

Smart Unit+ product design mainly follows the standards as below:

IEC 60265-1	Switches
IEC 60298	Metal-Endlosed Switchgear and Controigear
IEC 62271-100	Circuint-Breakers
IEC 62271-102	Disconrentors and Earthing Switches
GB1984-2003	高压交流断路器 High-voltage Alternating-current Circuit-breakers
GB3906-2006	3.6～40.5kV交流金属封闭开关设备和控制设备 Alternating-current Metal-enclosed Switchgear and Control Gear for Rated Voltages above 3.6 kV and up to and including 40.5 kV
GB3804-2004	3.6～40.5kV高压交流负荷开关 High-voltage Alternating-current Switches for Rated Voltage above 3.6 kV and less than 40.5 kV
GB16926-2009	高压交流负荷开关-熔断器组合电器 High-voltage Alternating Current Switch-fuse Combinations
GB1985	高压交流隔离开关和接地开关 High-voltage Alternating-current Disconnectors and Earthing Switches
DL/T402-2007	高压交流断路器订货技术条件 Specification of High-voltage Alternating-current Circuit-breakers
DL/T403	12～40.5kV高压真空断路器订货技术条件 HV Vacuum Circuit-breaker for Rated Voltage 12kV to 40.5Kv
DL/T486-2000	高压交流隔离开关和接地开关 High-voltage Alternating-current Disconnectors and Earthing Switches

技术参数列表

List of Technical Parameters

项目 Item	单位 Unit	参数 Parameters data
常规参数 Rated voltage		
额定电压 Rated voltage	kV	12
工频耐受电压 (1min) Power frequency withstand voltage (1min)	kV	42 (相间/相对地) , 48 (隔离断口) 42 (phase to phase/phase to ground), 48 (isolating fracture)
雷电冲击电压 (峰值) Lightning impulse voltage (peak value)	kV	75 (相间/相对地) , 85 (隔离断口) 75 (phase to phase/phase to ground), 85 (isolating fracture)
额定频率 Rated frequency	Hz	50
内部燃弧耐受电流 Internal arcing withstand current	kA/s	25/1
母线系统 Bus system		
额定电流 Rated current	A	630/1250
额定短时耐受电流 Rated short-time withstand current	kA/s	20-4 , 25-4
额定峰值耐受电流 Rated peak withstand current	kA	50/63
断路器单元 Circuit breaker unit		
额定电流 Rated current	A	630/1250
额定短路开断电流 Rated short circuit breaking current	kA	25/31.5
额定短路关合电流 Rated short-circuit making current	kA	63/80
额定短时耐受电流 Rated short-time withstand current	kA/s	20-4 , 31.5-4
额定容性电流开断等级 Rated capacitive current breaking grade		C2
额定电缆充电开断电流 Rated cable-charging breaking current	A	31.5
额定短路开断电流开断次数 Break times for rated short drop out current		E2
额定操作顺序 Rated operating sequence		O - 0.3S - CO - 180s - CO
断路器机械寿命 Circuit breaker's mechanical life		30000或50000 (根据所选断路器) 30000 or 50000 (According to the selected circuit breaker)
三工位隔离开关机械寿命 Three-position isolating switch's mechanical life		M1 3000

方案编号 Item		001	002	003	004	005
一次方案 PrimaryScheme						
额定电流 (A) Rated current		630	630	630		
主开关 Switcgear	断路器 Circuit breake	1	1	1		
	隔离开关 Isolating switch	1	1	1		1
电流互感器 (一体式) Current transformer (integrated)		1	1	1		
电压互感器 Voltage transformer					2	2
带电显示 Voltage indicator		1	1	1	1	1
故障显示 Fault display		1	1	1		
避雷针 Arrester					1	1
用途 Use		进线柜 Line counters	架空进线柜 Overhead Entering Line Cabinet	母联柜 Bus coupler cabinet	PT柜 PT	PT柜 PT
		*	*	*		

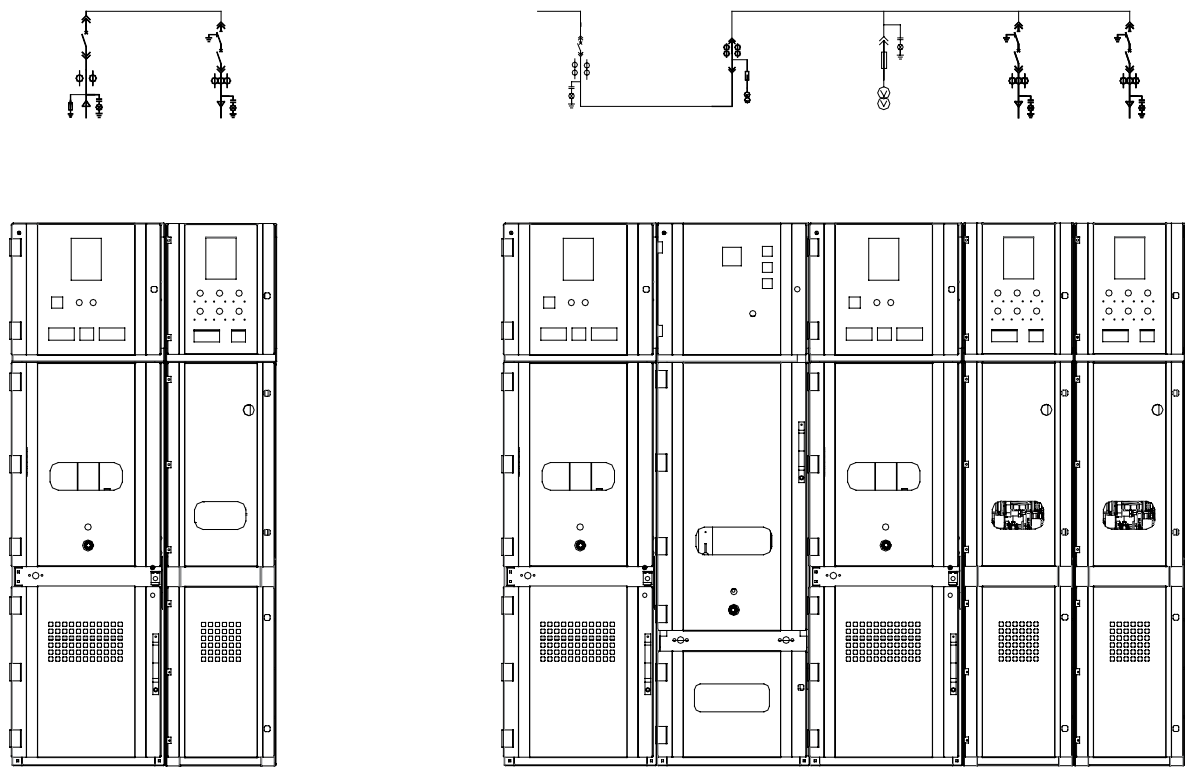
方案编号 Item		006	007	008	009	010
一次方案 PrimaryScheme						
额定电流 (A) Rated current		630	630		630	630
主开关 Switcgear	断路器 Circuit breake					
	隔离开关 Isolating switch	1	1			
电流互感器 (一体式) Current transformer (integrated)				2		
电压互感器 Voltage transformer				2		
带电显示 Voltage indicator		1	1	1	1	1
故障显示 Fault display		1	1			
避雷针 Arrester						
用途 Use		分段隔离柜 Sectional isolation cabinet	隔离柜 Isolation cabinet	计量柜 Metering cabinet	直连柜 Direct Connect Cabinet	母联转换柜 Bus coupler conversion cabinet

方案编号 Item		011	012	013	014	015
一次方案 PrimaryScheme						
额定电流 (A) Rated current		630	630	630		
主开关 Switcgear	断路器 Circuit breake	1	1	1		
	隔离开关 Isolating switch	1	1	1		1
电流互感器 (一体式) Current transformer (integrated)		1	1	1	1	1
电压互感器 Voltage transformer						
带电显示 Voltage indicator		1	1	1	1	1
故障显示 Fault display						
避雷针 Arrester		1				
用途 Use		出线柜 Outlet cabinet	出线柜 Outlet cabinet	架空进线柜 Overhead Entering Line Cabinet	PT柜 PT	PT柜 PT

方案编号 Item		016	017	018	019	
一次方案 PrimaryScheme						
额定电流 (A) Rated current		630-1250	630-1250	630-1250		
主开关 Switcgear	断路器 Circuit breake	1	1			
	计量手车			1		
	PT手车				1	
电流互感器 Current transformer		2	2	2		
电压互感器 Voltage transformer				2	2	
带电显示 Voltage indicator		1	1	1	1	
故障显示 Fault display		1	1	1		
避雷针 Arrester		1	1		1	
用途 Use		进线柜 Line counters	出线柜 Outlet cabinet	计量柜 Metering cabinet	PT柜 PT	

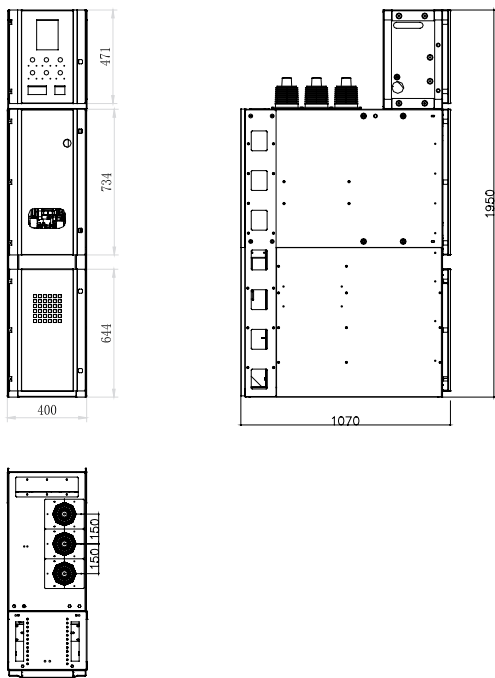
注: *号标注的, 在选型时请与技术人员沟通。
Note: * please contact the technical personnel in the selection.

典型方案组合
Typical Portfolio

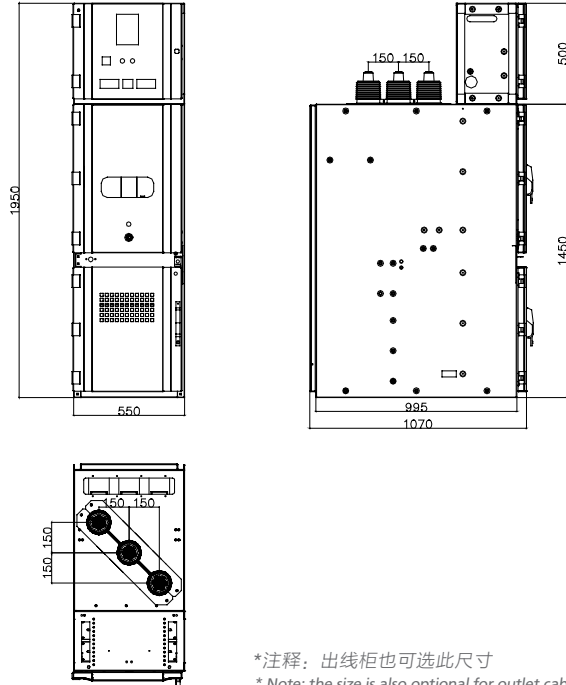


外形尺寸
Dimensions

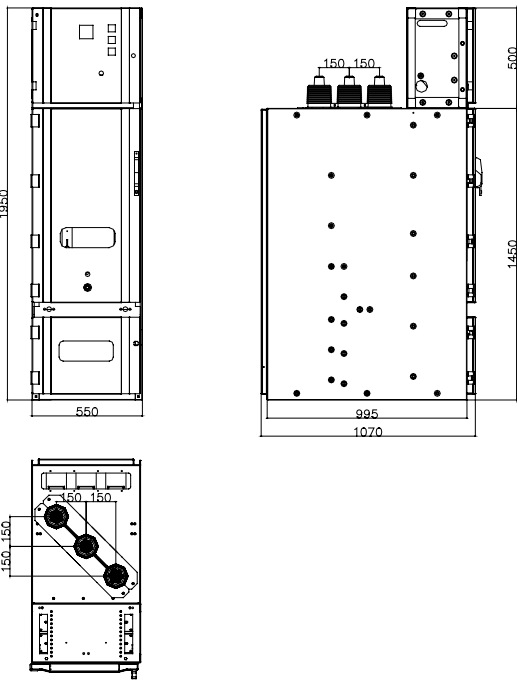
出线柜外形尺寸
Outline cabinet dimensions



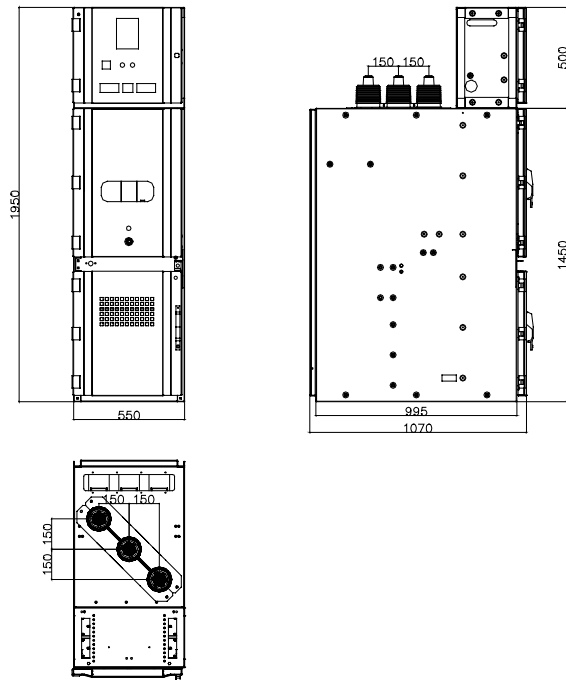
进线柜外形尺寸
Line counters dimensions

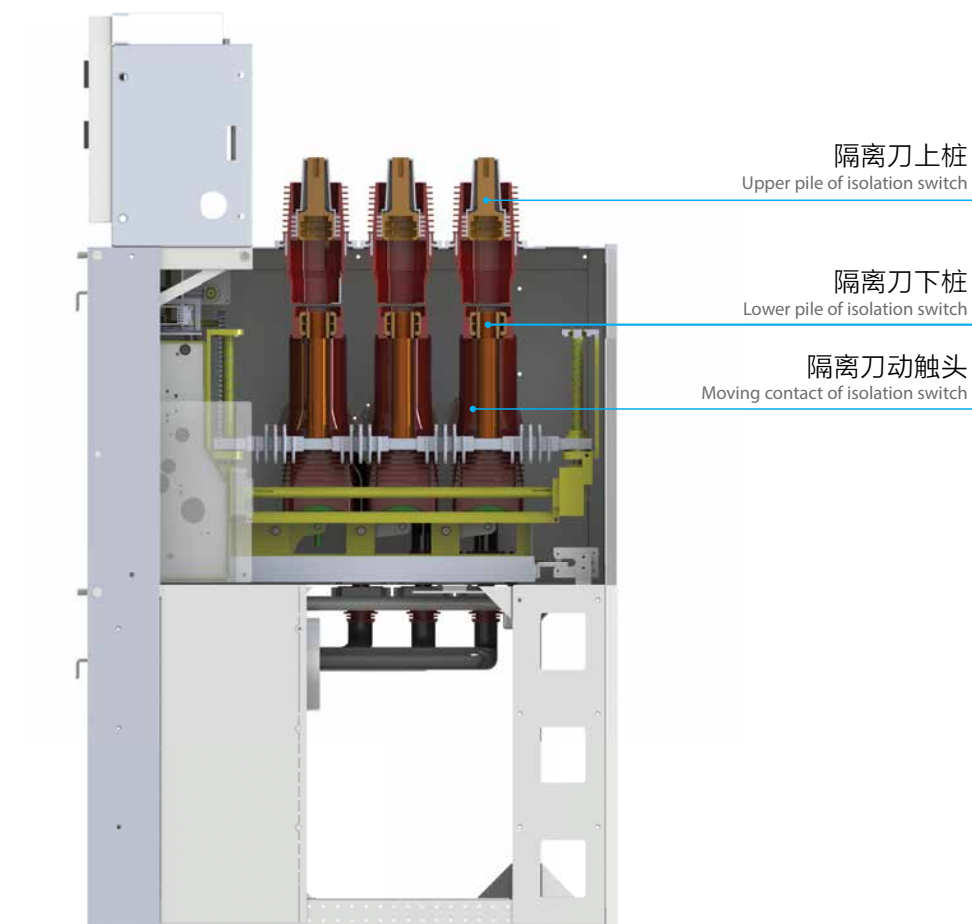


计量柜外形尺寸
Measuring cabinet dimensions



PT柜外形尺寸
PT cabinet dimensions



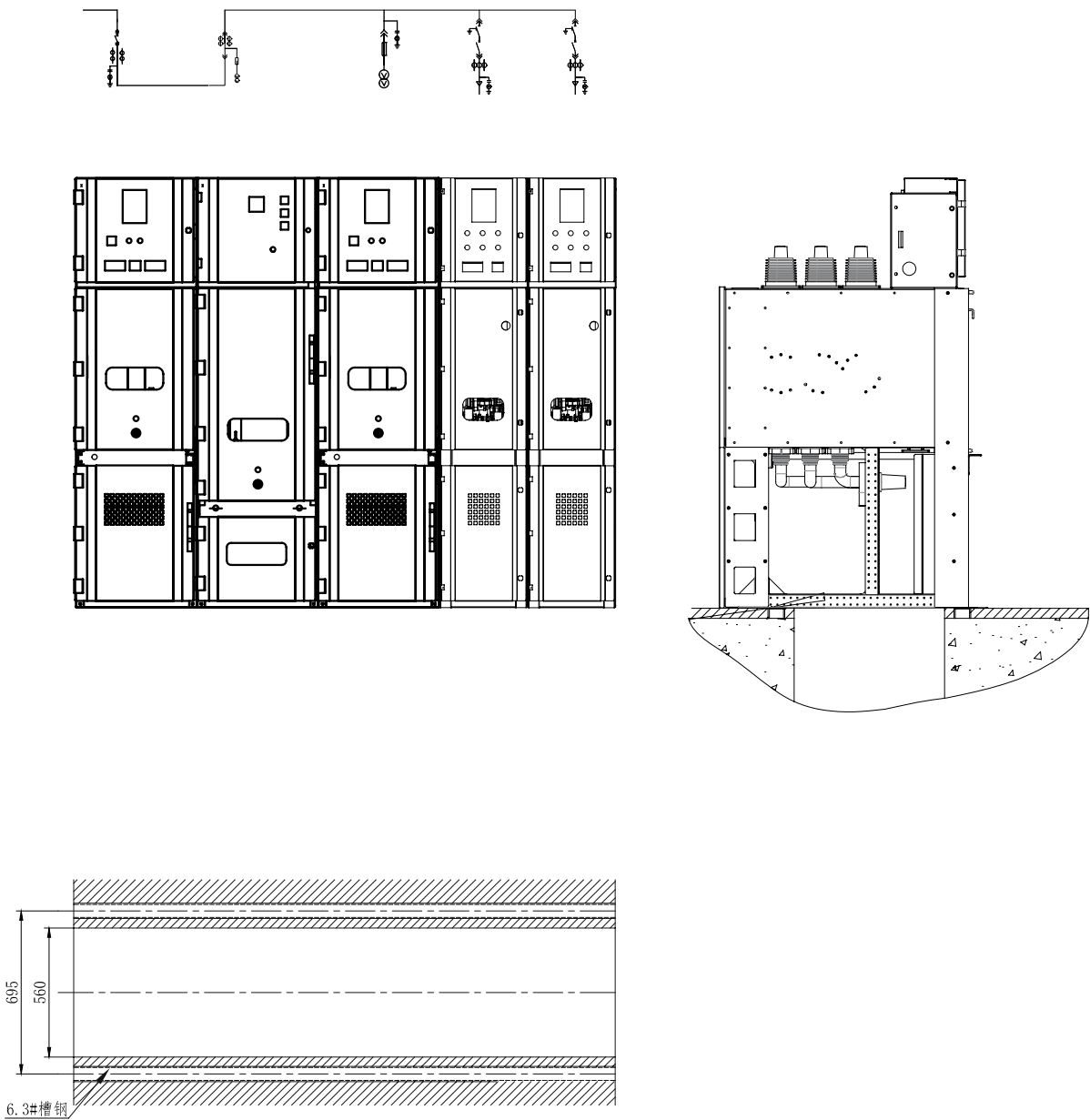


隔离刀特点

- 采用隔离刀与断路器一体化设计方案
- 隔离刀为管装直动式隔离刀
- 上下静刀头均置于塑料绝缘筒内
- 隔离刀配有手动电动一体的操作机构
- 隔离刀采用可视化端口设计，通过柜门前端观察窗可以清楚观察隔离刀闸的位置状态

Isolation switch characteristics:

- Isolation switch and circuit breaker integrated design scheme is adopted
- Isolation switch is the direct-acting type isolation switch installed in tube
- Upper and lower static tool bits are placed in plastic insulating cylinder
- Isolation switch is equipped with manual and electric integrated operating mechanism
- Isolation switch is of visual port design. You can observe the position state of the isolation switch clearly through the inspection window on the front-end of the cabinet door



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