

SIS-12 Series Core Unit



1. 产品概述 Overview

SIS-12/630(1250)-20(25)固体绝缘环网开关设备是新一代环保型复合绝缘环网柜。主要由三种部件组成，即 V 单元（断路器单元），C 单元（负荷开关单元），F 单元（组合电器单元），每个单元可以单独使用也可以自由扩展，其结构分为智能控制仪表室、操作机构和一次部分。

仪表室可配微机保护（控制器），一次部分采用 APG 自动凝胶工艺，将隔离开关和灭弧室完全固封在环氧树脂中，并有专用接头和母线相连。

灭弧室采用专用的铜铬触头材料，R 型纵磁场触头，以及完全一次封排工艺，该灭弧室开断短路电流能力及稳定性，电寿命，温升以及绝缘水平都较之前的灭弧室有了明显提高。

操动机构采用与开关配合一体的弹操机构，即隔离开关和主开关弹操机构为一整体，可方便实现互锁，而且机构零件少减少了不必要的传动环节，可靠性高，并可根据用户需要实现电动操作。

固体绝缘全封闭开关设备：是采用固体绝缘材料为主绝缘介质及导电连接、隔离开关、接地开关、主母线、分支母线等主导电回路单一或组合后用固体绝缘介质包覆封装为一个或几个具有一定功能、可再次组合或扩展的具备全绝缘、全密封性能模块。

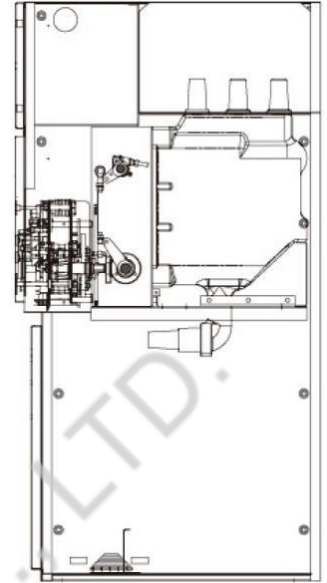
SIS-12/630(1250)-20(25) solid insulated ring network switchgear is a new generation of environmentally friendly composite insulated ring network cabinet. Mainly composed of three components, namely V unit (breaker unit), C unit (load switch unit), and F unit (combination unit). Each unit can be used separately or freely expanded its structure is divided into intelligent control instruments room, operating mechanism and primary part.

The instrument room can be equipped with microcomputer protection (controller), the primary part adopts APG automatic gel process, the isolating switch and the interrupter are completely sealed in epoxy resin, and connected by special connectors and busbars.

The interrupter adopts special copper chromium contact material, R-type longitudinal magnetic field contact, and a complete one-time sealing process. The short circuit current capability and stability, electrical life, temperature rise and insulation level of the interrupter have been significantly improved.

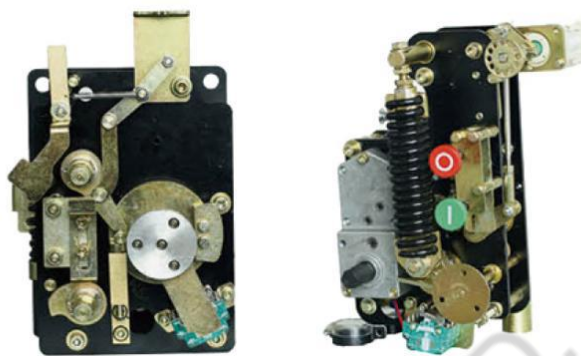
The operating mechanism adopts a spring operating mechanism integrated with the switch, that is, the isolating switch and the main switch spring operating mechanism are integrated, which can facilitate the realization of interlocking, and less mechanical parts reduces unnecessary transmission links, and the reliability is high, and electric operation can be realized according to user needs.

Solid insulated fully enclosed switchgear: it uses solid insulated material as the main insulation medium, main conductive circuit like conductive connection, isolating switch, earth switch, main busbar, branch busbar etc. are single or combined with solid insulation medium to cover and encapsulate one or more fully insulated and fully sealed module with certain functions that can be combined or expanded again.



2. 使用环境 Use Environment

- 海拔高度: ≤ 5000 米
- 适应环境温度: $-50^{\circ}\text{C} \sim +70^{\circ}\text{C}$
- 空气相对湿度: $\leq 95\%$ ($+25^{\circ}\text{C}$)
- 地面倾斜度: $\leq 5^{\circ}$
- 地震烈度: 不超过 8 度
- Altitude: $\leq 5000\text{m}$
- Ambient temperature: $-50^{\circ}\text{C} \sim +70^{\circ}\text{C}$
- Relative air humidity: $\leq 95\%$ ($+25^{\circ}\text{C}$)
- Ground inclination: $\leq 5^{\circ}$
- Earthquake intensity: not exceed 8 degree



3. 主要技术参数 Main Technical Parameters

● 开关设备技术参数 Switchgear technical parameters

项目 Item		单位 Unit	数据 Value
额定电压 Rated voltage		kV	12
额定频率 Rated frequency		Hz	50
额定电流 Rated current		A	630, 1250
工频耐压 Power frequency withstand voltage	相间, 相对地 Phase-to-phase, phase-to-earth	kV	42
	断口 across open contacts		48
雷电冲击耐压 Lightning impulse withstand voltage	相间, 相对地 Phase-to-phase, phase-to-earth	kV	75
	断口 across open contacts		85
额定短路开断电流 Rated short circuit breaking current		kA	20, 25
额定短时耐受电流 Rated short time withstand current		kA	20, 25
额定峰值耐受电流 Rated peak value withstand current		kA	50, 63
额定短路关合电流 Rated short circuit making current		kA	50, 63
外壳防护等级 Shell protection degree			IP4X
操作方式 Operating mode			弹簧储能 Spring charging

● 断路器技术参数 Circuit breaker technical parameters

项目 Item		单位 Unit	数据 Value
额定电压 Rated voltage		kV	12
额定频率 Rated frequency		Hz	50
额定电流 Rated current		A	630, 1250
额定绝缘水平 Rated insulation level	1min 工频耐压 1min power frequency withstand voltage	kV	42
	雷电冲击耐压 Lightning impulse withstand voltage		75
额定短路开断电流 Rated short circuit breaking current		kA	20, 25
额定短路关合电流 (峰值) Rated short circuit making current (peak)		kA	50, 63
额定峰值耐受电流 Rated peak value withstand current		kA	50, 63
额定短时耐受电流 (有效值) Rated short time withstand current (RMS)		kA	20, 25
额定短时开断电流开断次数 Breaking number of rated short time breaking current		次 times	30

额定短路开断持续时间 Rated short circuit breaking duration	S	4
额定操作顺序 Rated operating sequence	自动重合闸 auto reclose (rated short circuit breaking current below 31.5kA)	O-0.3s-CO-180s-CO
	非自动重合闸 not auto reclose (rated short circuit breaking current below 40kA)	O-180s-CO-180s-CO
机械寿命 Mechanical life	次 times	10000

● 隔离接地开关技术参数 Isolating switch technical parameters

项目 Item	单位 Unit	数据 Value
额定电压 Rated voltage	kV	12
额定电流 Rated current	A	630, 1250
4S 额定短时耐受电流 (有效值) 4S rated short time withstand current (RMS)	kA	20, 25
额定峰值耐受电流 Rated peak value withstand current	kA	50, 63
1min 工频耐压 1min power frequency withstand voltage	相间, 对地 Phase-to-phase, to earth	42
	隔离断口 Isolating distance	48
雷电冲击耐压 Lightning impulse withstand voltage	相间, 对地 Phase-to-phase, to earth	75
	隔离断口 Isolating distance	85
隔离开关机械寿命 Mechanical life of isolating switch (O-C)	次 times	3000
接地开关机械寿命 Mechanical life of earth switch (O-earthing)	次 times	3000

● 断路器 Circuit breaker

项目 Item	单位 Unit	数据 Value	
灭弧室类型 Interrupter type		Vacuum	
额定电流 Rated current	A	630, 1250	
额定短路开断电流 Rated short circuit breaking current	交流分量有效值 AC component RMS	20, 25	
	开断次数 Breaking number	30	
额定操作顺序 Rated operating sequence		O-0.3s-CO-180s-CO	
额定短时耐受电流/持续时间 Rated short time withstand current/duration	kA/S	25/4	
额定峰值耐受电流 Rated peak value withstand current	kA	50, 63	
额定短路关合电流 (峰值) Rated short circuit making current (peak)	kA	50, 63	
分闸平均速度 Opening average speed	m/s	1.4±0.2	
合闸平均速度 Closing average speed	m/s	0.8±0.2	
合闸弹跳时间 Closing bounce time	ms	≤2	
分闸触头反弹幅度 opening contact rebound distance	mm	≤2	
合闸时间 Closing time	ms	30~70	
分闸时间 Opening time	ms	20~50	
三相不同期 Three phase asynchronism	ms	≤2	
异相接地故障开断电流 Out-phase grounding fault breaking current	试验电流 Test current	kA	21.7
	试验电压 Test voltage	kV	12
容性电流开断试验 Capacitive current breaking test	试验电流 Test current	A	25
	试验电压 Test voltage	kV	12
主回路电阻 Main circuit resistance	μΩ	≤120	
机械寿命 Mechanical life	次 times	10000	

● 组合电器 Combination

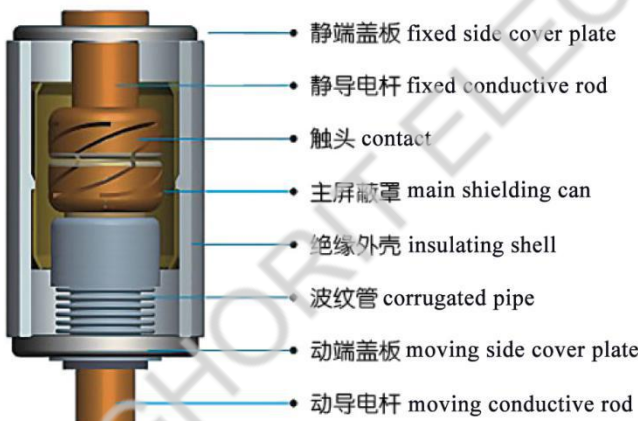
项目 Item	单位 Unit	参数 Parameter
灭弧室类型 Interrupter type		真空 Vacuum
额定电流 Rated current	A	125
额定短路开断电流 Rated short circuit breaking current	kA	31.5
额定转移电流 Rated transfer current	A	3150
额定交接电流 Rated take-over current	A	3150

● 隔离开关 Isolating switch

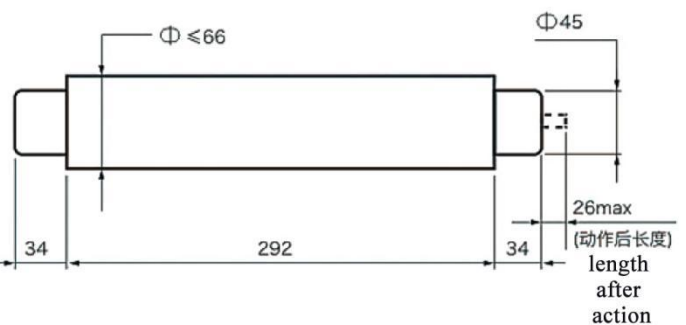
项目 Item	单位 Unit	参数 Parameter
额定电流 Rated current	A	630, 1250
主回路电阻 Main circuit resistance	$\mu\Omega$	≤ 20
额定短时耐受电流/持续时间 Rated short time withstand current/duration	kA/S	25/4
额定峰值耐受电流 Rated peak value withstand current	kA	50, 63
机械寿命 Mechanical life	次 times	3000

● 接地开关 Earth switch

项目 Item	单位 Unit	参数 Parameter
额定短时耐受电流/持续时间 Rated short time withstand current/duration	kA/S	25/4
额定峰值耐受电流 Rated peak value withstand current	kA	50, 63
机械寿命 Mechanical life	次 times	3000



真空管 vacuum interrupter



熔断器 fuse

4. 熔断器与变压器选型表 Fuse and Power Transformer Selection Table

具有以下显著特点:

与真空负荷开关组合, 转移电流可达 3150A;

全系列配变保护, 最大熔芯电流可达 200A;

双重的接地保护, 可靠的五防联锁, 安全性能更高;

选用标准熔断器, 方便用户备品备件。

It has the following salient features:

Combined with a vacuum load switch, the transfer current can reach 3150A;

Full range of distribution transformer protection, the maximum fuse core current can reach 200A;

Double grounding protection, reliable five-proof interlock, higher safety performance;

Standard fuse is selected, which is convenient for users to spare parts.

变压器初级电压 Primary voltage of transformer (kV)		变压器额定容量 Rated capacity of transformer(kVA)																
		25	50	75	100	125	160	200	250	315	400	500	630	800	1000	1250	1600	
3	熔断器额定电流 Rated current of fuse (A)	16	20	31.5	40	50	50	63	80	100	125	160						
3.3		10	20	25	40	40	40	63	80	80	125	125	160					
6		6	16	20	25	25	31.5	40	50	50	63	80	100	125	160			
10		6	10	10	16	20	25	25	31.5	40	50	50	63	80	100	125		
11		6	10	10	16	20	20	25	25	40	40	50	50	63	80	100	125	

5. 应用领域 Application Field

- 低温寒冷地区：无 SF6 气体应用，无需考虑 SF6 气体低温运行问题，在-45℃下也能正常运行。
- 高原地区：无需考虑高原大气压对绝缘性能的影响。
- 强风沙地区：固体绝缘环网柜本体安全防护等级 IP67，控制回路室采用特殊处理确保强风沙地区长期运行。
- 沿海潮湿地区：环氧树脂密封，抗潮湿，抗盐雾腐蚀，确保在沿海地区能长期使用。
- 高环保要求地区：SF6 气体对大气温室化影响已经高度引起重视，固体环网柜取消了 SF6 气体，对环境和人身无任何污染和伤害。
- 智能电网中：由于主开关都能实现电动，选配智能控制器可对开关设备和变电站现场进行遥控、遥测、通讯，既能进行分散控制，又能方便集中控制。
- Low temperature and cold area: No SF6 gas application, no need to consider the low temperature operation of SF6 gas, and it can operate normally at -45°C.
- Plateau area: No need to consider the influence of plateau atmospheric pressure on insulation performance.
- Strong sandy areas: The solid insulated ring main unit has a safety protection level of IP67, and the control circuit room adopts special treatment to ensure long-term operation in strong sandy areas.
- Coastal damp areas: epoxy resin sealing, resistance to moisture and salt spray corrosion, to ensure long-term use in coastal areas.
- Areas with high environmental protection requirements: The impact of SF6 gas on atmospheric warming has attracted great attention. The solid insulated ring network cabinet has cancelled SF6 gas, and there is no pollution and harm to the environment and people.
- Smart grid: Since the main switch can be electric operated, the intelligent controller can be used to remotely control, remotely measure and remotely communicate the switchgear and substation site, which can perform decentralized control and facilitate centralized control.



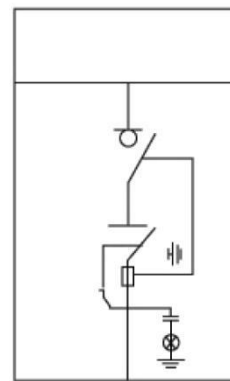
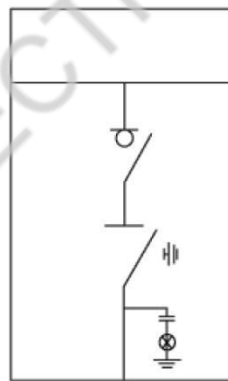
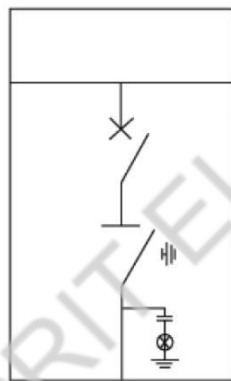
6. 设计方案 Design Scheme

断路器柜 负荷开关柜 熔丝组合电器柜
 Circuit breaker cabinet Load switch cabinet Fuse combination cabinet

"V"

"C"

"F"



计量柜
 Metering cabinet

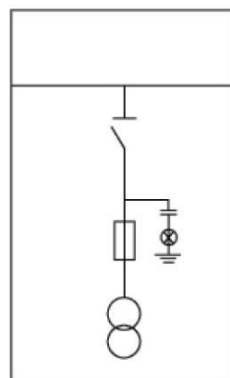
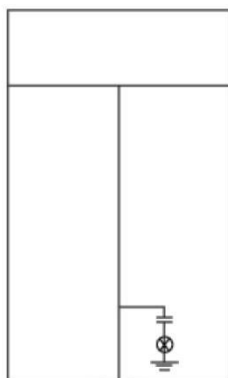
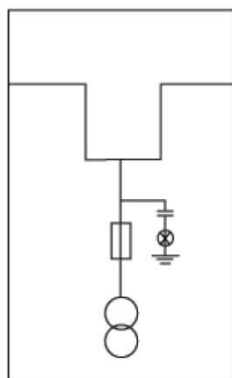
电缆柜
 Cable cabinet

PT柜
 PT cabinet

"M"

"D"

"G"



7. 安全与保护 Safety and Protection

- 隔离刀可视断口

柜前有明显的隔离断口可视窗口，可查看隔离合位、隔离分位、接地合位，三个工作位置，方便现场工作人员检修确定隔离刀位置，非常安全。

- 泄压设计

内部燃弧压力阀：当产品内部出现燃弧时，会从该压力释放阀释放压力，燃弧排至电缆沟，以免误伤操作人员。

- 绿色环保

采用环保性材料设计，不使用 SF6 气体作为灭弧介质及绝缘，对环境没有污染，次回路采用最少的接点设计，确保运行期间低能耗。

- Visible isolating distance of isolating switch

There is an obvious visible window for the isolating distance in the front of the cabinet, which can view the isolating closing position, isolating opening position, and earthing closing position, three working positions, which are convenient for on-site staff to check and determine the position of the isolating switch, which is very safe.

- Pressure relief design

Internal arcing pressure valve: When an arc occurs inside the product, the pressure will be released from the pressure release valve, and the arc will be discharged to the cable trench to avoid accidental injury to the operator.

- Green and environmental friendly

It adopts environmental protection material design, does not use SF6 gas as arc extinguishing medium and insulation, and does not pollute the environment. The secondary circuit adopts the minimum contact design to ensure low energy consumption during operation.



8. 外形与安装 Overall Dimensions and Installation

