



## 单元式金属封闭开关柜 Unit Metal-enclosed Switchgear

# ASGN



天仑电气 - 为您提供一流的电力系统解决方案  
Tianlun Electric, provide you with first-class power system solution

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宁波天仑电气有限公司  
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## 公司简介 Introduction

宁波天仑电气有限公司(以下简称公司)成立于2001年1月。

公司坐落于浙江宁波,毗邻“东方大港”北仑港。拥有10000平方米的研发生产基地,年产值超亿元,目前有80多名年轻朝气的员工,其中60%为本科学历。公司是集研发、生产、销售、服务于一体的高新技术企业,致力于打造高品质的智能化、节能型、定制模式的输变电设备产品。

公司目前有符合国际及国内标准3大类18种产品,包括24kV中置式开关柜及环网柜,12kV中置式开关柜及环网柜,440V固定式分隔柜,抽屉式开关柜,预装式变电站,低压母线槽(合作生产),10kV变压器(合作生产)等等,同时部分为ABB、Schneider的授权产品。公司立足于浙江,为很多大型的制造企业、房产开发、学校、港口等用户提供了许多高质量的产品和服务,同时也出口到东非、北非及东南亚国家,获得了客户的一致满意。

公司严格执行ISO9001质量保证体系,标准化体系,安全生产标准体系,国家CCC认证体系。坚持持续提升产品质量,追求零缺陷产品,全心全意服务用户的质量方针,坚持以人为本,鼓励创新,精细化的管理理念,坚持以感恩在心为核心价值观,为我们的用户提供最好的产品和服务。

Ningbo TIANLUN Electric Co., Ltd was established in year 2001, January. It is located in Ningbo, near Beilun port, which is called "oriental grand port". TIANLUN has 10000-square-meter researching and developing workshop and annual output value exceeds 100 million. TIANLUN has a professional team composed of 80 innovative staff, most of them have bachelor's degrees. TIANLUN is a company that integrates researching, developing, selling and service. Our purpose is to create high quality electric equipment product which is intelligentized, energy-saving and customized.

TIANLUN mainly have 18 types of products which belong to 3 majors as follow: 24 kV Intermediate switchgear and Ring Main Unit Switchgear, 12kV Intermediate Switchgear and Ring Main Unit Switchgear, 440V Fixed Isolated Switchgear, Preparatory Transformer Substation, Low Voltage Bus Duct (coproduction) and 10kV transformer (coproduction). Some products are Licensed by ABB and Schneider. TIANLUN have been providing high quality products to large manufacture enterprise, real estate, school and port constructions. At the mean time, our product are exported to Africa and southeastern countries and win satisfaction from the overseas customers.

TIANLUN strictly stick to ISO9001 standard system, standardization system, safety standard system and CCC authentication system. Our quality policy is producing good and zero defect product, having customers well served. Our management policy is people orientation, creation encouragement and high-effective system. TIANLUN always hold a thankful heart and provide top-level product with best service.

## 产品介绍 Product Introduction

ASGN 开关柜,为模块化设计的12kV空气绝缘开关柜。该柜采用SchneiderAS12三工位SF6开关,并由成套厂组装完成,具有结构简单,方案灵活,操作便捷,安全可靠等特点。针对不同的应用场合,不同的用户需求,均能提供令人满意的解决方案。

ASGN switchgear is 12kV air-insulated switchgear featuring modular design. The switchgear uses Schneider AS12 three-position SF6 switches which are assembled in complete set factory, characterized by simple structure, flexible scheme, easy-to-use, high safety and reliability. Based on different applications and various user demands, satisfactory solutions will be provided.



## 遵循标准 Standards:

- GB3804
- GB3906
- GB/T 11022
- GB16926
- DL/T 404
- DL/T 593
- IEC60265-1
- IEC62271-1
- IEC62271-102
- IEC62271-105
- IEC62271-200



ISO9001-2000



CCC 认证



WSC 北京世标认证中心





## 应用领域 供电网系统

### Normal Applications

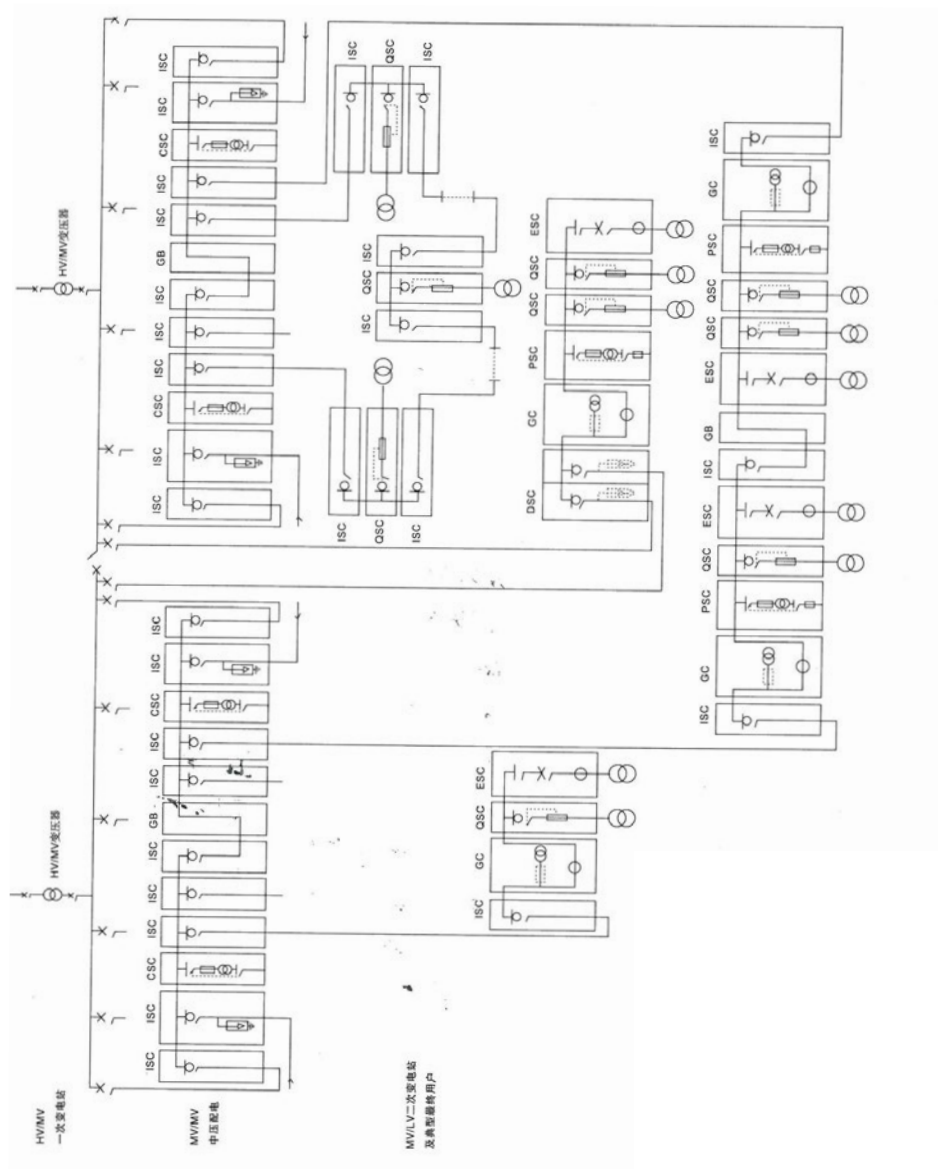
#### Power Supply Network System

发电厂发出的中压电能经过 MV/HV 主变传送到高压电网。一般来说，电力通过架空线传送到一次变电站。

- 在 HV/MV 一次变电站中，电力从高压转变为中压。
- 在 MV/MV 一次变电站中，电力被输送到若干个下级二次变电站。断路器在输配电中起着重要的作用。
- 在 MV/LV 二次变电站中，其电压等级从 MV 转变为 LV，并送至最终用户。在二次变电站中，负荷开关起主要的作用。

The medium-voltage electric energy generated by power plant is transmitted to high-voltage power grid through MV/HV main transformer.

- In general, the electric power is transmitted to primary substation through overhead line.
- In HV/MV primary substation, the electric power is converted into medium voltage from high voltage.
- in MV/MV primary substation, the electric power is transmitted to several secondary substations at lower level. The circuit breaker plays an important role in power transmission and distribution.



## 应用领域 中压 / 低压变电站

### APPLICATIONS

#### Medium-voltage/low-voltage Substation

##### 定义

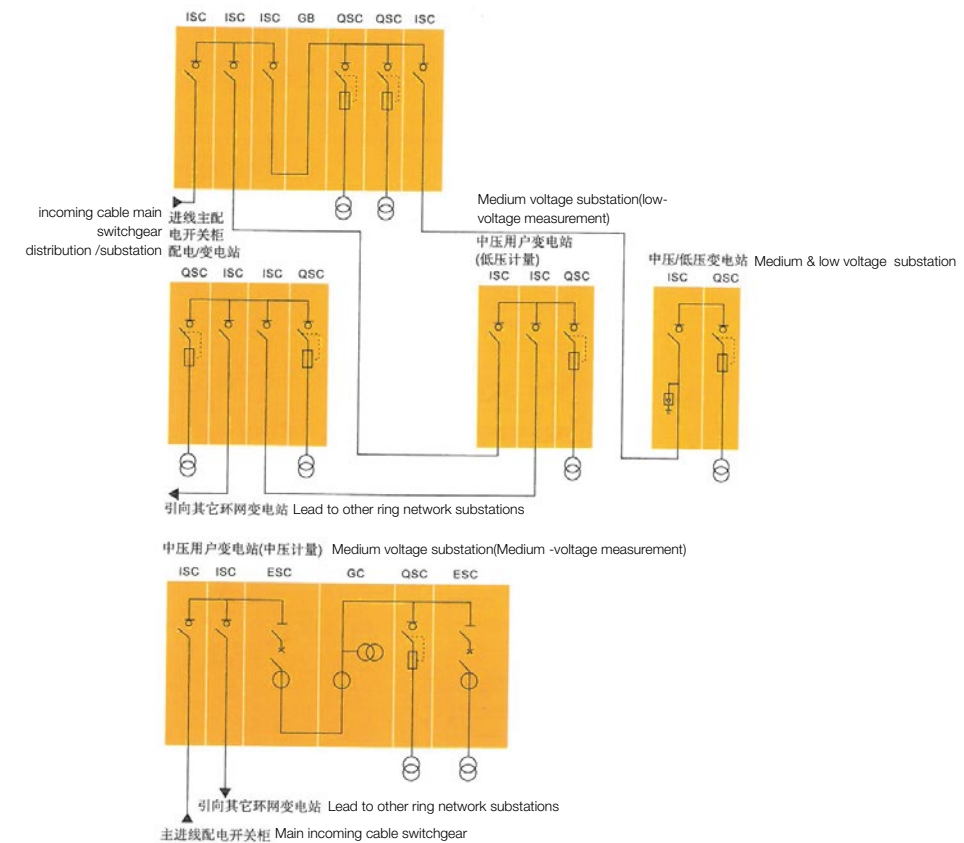
- 以下列出的是用于中压 / 低压变电站和工矿配电站的 ASGN 系列产品
- ISC: 负荷开关进线、出线或连接柜
- QSC: 熔断器 + 负荷开关组合柜
- ESC: 隔离开关 + 真空断路器柜
- PSC: 电压互感器柜
- GC: 电流 / 电压计量柜
- DSC: 双电源进线柜
- GB: 母线升高柜
- GA: 进线电缆连接柜
- CSC: 站用变柜
- 其它柜: 请向制造厂商咨询

##### Definitions

- The followings are ASGN Series products used for medium-voltage/low-voltage substations and industrial and mining power distribution stations
- ISC: load switch incoming line, outgoing line or connecting cabinet
- QSC: fuse + load switch combination cabinet
- ESC: Disconnector + vacuum circuit breaker cabinet
- PSC: voltage transformer cabinet
- GC: current/voltage metering cabinet
- DSC: dual power supply incoming line cabinet
- GB: bus lifting cabinet
- GA: incoming cable connection cabinet
- CSC: Transformer Cabinet for Substation
- Other cabinets: please consult with the manufacturer

## 中压用户变电站

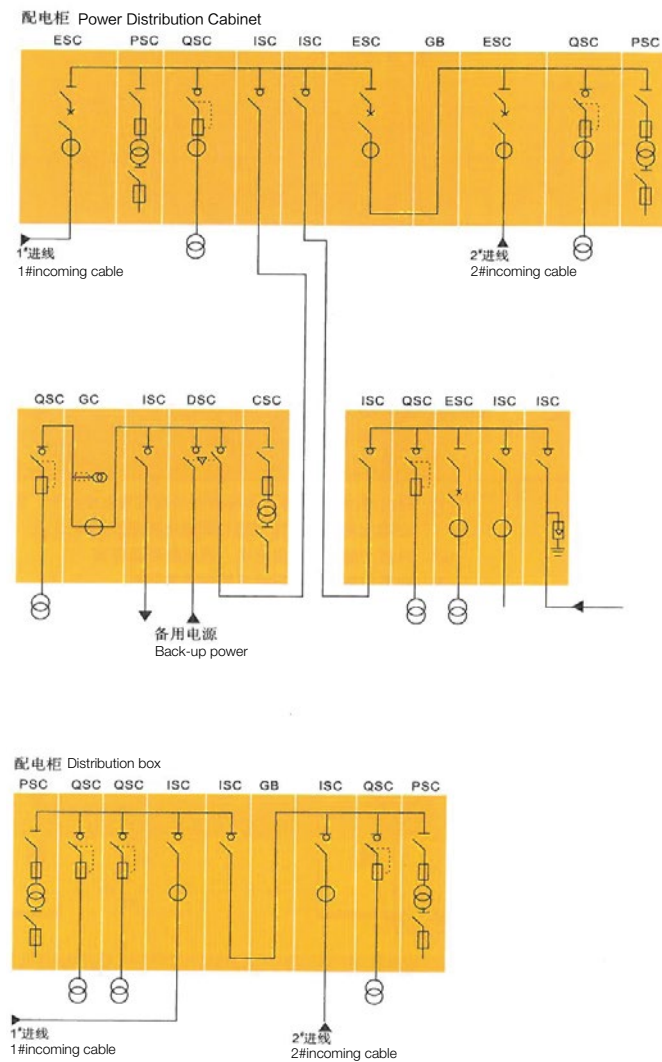
### Medium voltage substation



## 应用领域 工矿配电站

### APPLICATIONS

### Industrial and Mining Power Distribution Stations



## 主要电气特性

### Main electrical characteristics

额定电压 Rated voltage	kV	12
额定电流 (1) Rated current (1)	A	630
绝缘水平 Level of insulation	工频耐压 (相间及对地 / 断口间) Power frequency withstand voltage (phase to phase and to the earth / fracture to fracture)	kV 50Hz, 1min
	冲击耐压 (相间及对地 / 断口间) Impulse voltage (phase to phase and to the earth / fracture to fracture)	kV peak
额定短时耐受电流 (主开关及三工位开关内的接地开关) (2) Rated short time withstand current (earth switch inside main switch and three-position switch)	kA/s	20/3 或 25/1
额定峰值耐受电流 (主开关及三工位开关内的接地开关) Rated peak withstand current (earth switch inside main switch and three-position switch)	kA/peak	50kA 或 63kA
关合电流 (3) Making current (3)	kA	50kA 或 63kA
开断空载变压器励磁电流 Breaking non-loaded transformer excitation current	A	16
开断空载电缆 Breaking non-loaded cable	A	25
5% 额定负荷开断电流 5% rated load breaking current	A	31.5
最大分断转移电流 Max. breaking transfer current	A	1750
额定闭环开断电流 Rated closed loop breaking current	A	630
熔断器最大额定电流 Max. rated current of fuse	A	125
相间距 Distances between poles	mm	200

1. 根据 IEC 标准推荐, 本特性在最高环境温度 40℃, 24 小时平均温度 35℃ 以下有效。在温度更高时, 需要进行额定电流降额计算
2. 对短时耐受有更高要求, 请向施耐德咨询
3. 此系预期值, 实际电流受熔断器限制

- 1.As recommended by IEC standards, this characteristics is valid in the environment where the maximum ambient temperature is 40°C and average temperature during 24 hours is below 35°C . For higher temperature, derating of rated current is required.
- 2.For higher requirements for the short time withstand, please consult with Schneider.
- 3.This is an expected value and the actual current is limited by fuse.

## 最大分断能力

### Maximum Interrupting Capacity

额定电压 Rated voltage	12kV
ISC	630A
DSC	630A
ESC	25kA
QSC	25kA

## 寿命 Lifetime

柜型 Cabinet type	机械寿命 Mechanical life	电气寿命 Electric life
ISC,QSC	主开关 5000 次, 接地开关 3000 次 Main switch: 5000 times, earth switch: 3000 times	E3
ESC	断路器 3000 次 Circuit breaker: 3000 times	E2

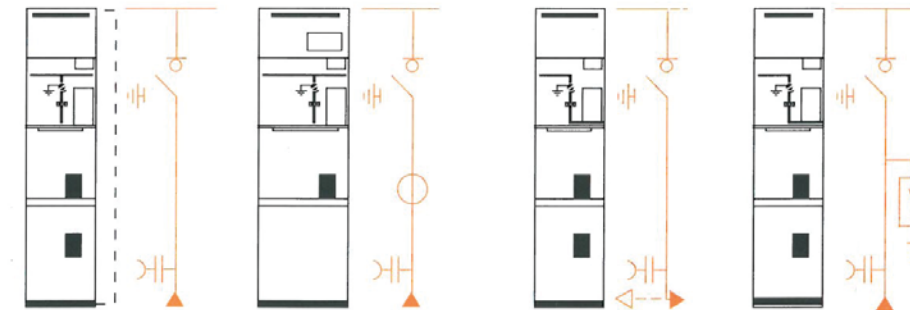
## 环境条件 Maximum Interrupting Capacity

- 环境温度: -15℃到 +40℃
- 湿度: 24 小时平均湿度不高于 95%, 1 个月平均湿度不高于 90%
- 海拔高度: 低于或等于 1000m
- 开关柜防护等级: IP3X
- SF6 充气压力 0.4bar (相对压力), 年泄漏率小等于 0.05%。
- 特殊环境条件, 有别于上述条件的特殊运行环境, 需要制造商与用户协商解决。

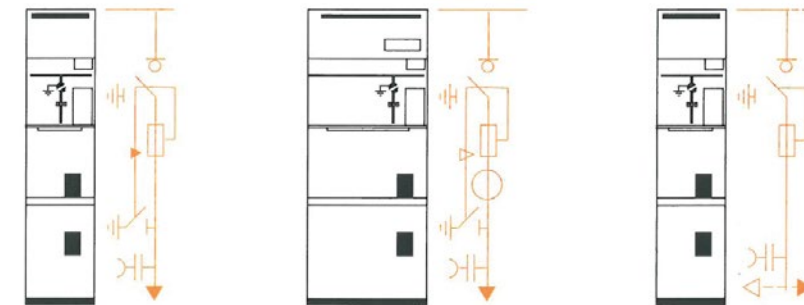
- Ambient temperature: -15℃ to +40℃
- Humidity: average humidity during 24 hours is not higher than 95%, and that during 1 month is not higher than 90%
- Elevation: lower than or equal to 1000m
- Protection class of switchgear: IP3X
- SF6 inflation pressure 0.4 bar (relative pressure), annual leakage rate less than or equal to 0.05%.
- For operations under special environmental conditions different from the above mentioned ones, the manufacturer needs to negotiate with users.

## 各种功能柜 Various Functional Switchgears

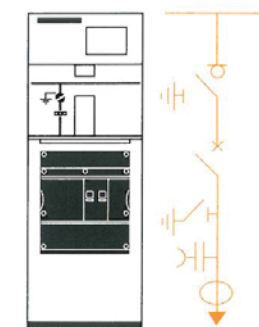
### 负荷开关进出线柜 (ISC) Incoming and Outgoing Line Cabinet of Load Switch (ISC)Capacity



### 负荷开关 - 熔断器组合柜 (QSC) Load Switch - Fuse Combination Cabinet (QSC) Switch (ISC)Capacity



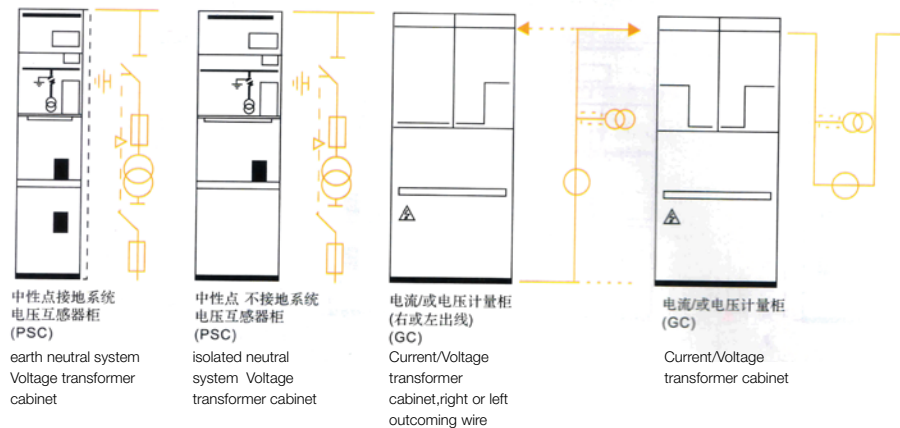
### 断路器柜 (ESC) Circuit Breaker Cabinet (ESC)(QSC) Switch (ISC)Capacity



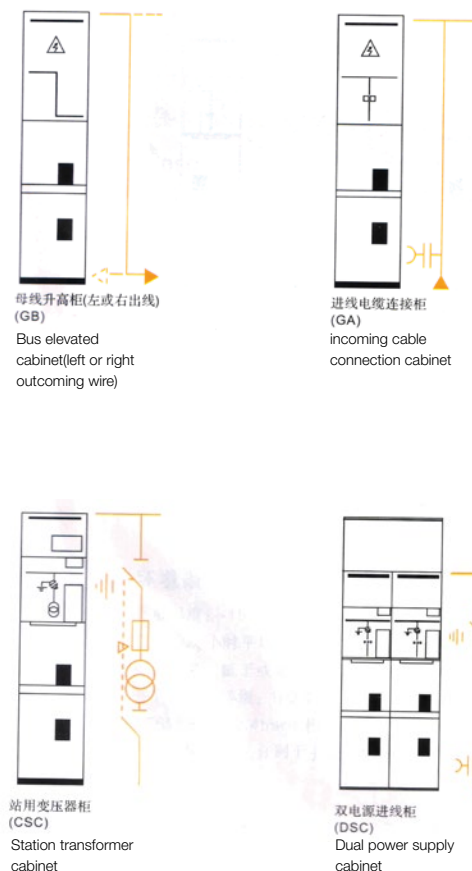
## 各种功能柜

### Various Functional Switchgears

#### 测量柜 Measuring cabinet



#### 专用柜 Special cabinet



## 柜体间隔说明

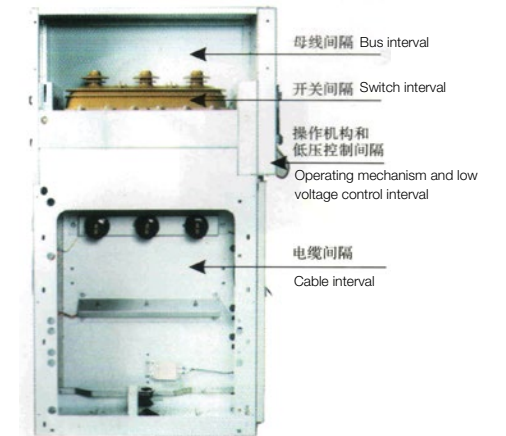
### THE INTERVAL THAT

ASGN 间隔式金属封闭开关柜由以下 4 个隔室组成:

- 母线间隔
- 开关间隔
- 电缆间隔
- 操作机构和低压控制间隔

ASGN interval metal enclosed switchgear consists of the following 4 compartments:

- Bus interval
- Switching interval
- Cable spacing
- Operating mechanism and low pressure control interval



#### 母线间隔

母线间隔布置在柜的上部, 三根绝缘母线平行安装, 柜体可向两侧扩展。母线可通过额定电流 630-1250A。

#### Bus interval

The bus interval are arranged in the cabinet of the upper, three insulated busbars are arranged in parallel, the cabinet body can be extended to both sides. Bus bar can be rated by 630-1250A.

#### 开关间隔

开关被密封在 SF6 气体的气室内。开关壳体将母线间隔和电缆间隔分开。

#### Switching interval

The switch is sealed in the gas chamber of the SF6 gas. The switch housing separates the bus bar and the cable interval.

#### 电缆间隔

电网进线电缆与开关下口连接。变压器电缆与熔断器座下端子或断路器下端子相连接。同时电缆间隔还可以安装熔断器、断路器、避雷器、电流互感器、下接地开关等元件。作为标准配置, 柜门有观察窗和安全联锁装置。电缆底板配密封盖和带支撑架的电缆夹。

#### Cable spacing

Connection between the cable and the switch of the power grid. The transformer cable is connected with the terminal of the fuse block or the circuit breaker. At the same time, the cable can also be installed in the fuse, circuit breakers, lightning arrester, current transformer, the next grounding switch and other components. As standard, the door with an observation window and a safety interlock device. With the sealing cover and bottom cable with cable support clip.

#### 操作机构和低压控制间隔

该间隔可在电缆和母线带电的情况下操作开关。间隔内可安装带电指示器, 辅助触点、脱扣元件, 电机, 钥匙锁等附件。控制回路, 计量仪表和保护继电器可以安装在低压控制室内, 若容积不够, 可在柜顶增加一个低压间。

#### Operating mechanism and low pressure control interval

The operation switch can be operated in the case of the cable and the bus bar. Interval installation charge indicator, auxiliary contacts, release components, motor, key lock and other accessories. Control circuit, measuring instruments and protective relays can be installed in the low pressure control room, if the volume is not enough, can be added to the top of a low pressure chamber.



## 功能元件 Functional Elements

### 上部单元:

- SchneiderAS12 中压开关
- 3 工位开关
- 操作机构
- 上部壳体
- 低压控制小室
- 联锁装置
- 带电指示装置
- 母线
- 低压进线
- 低压保护

### Upper Unit:

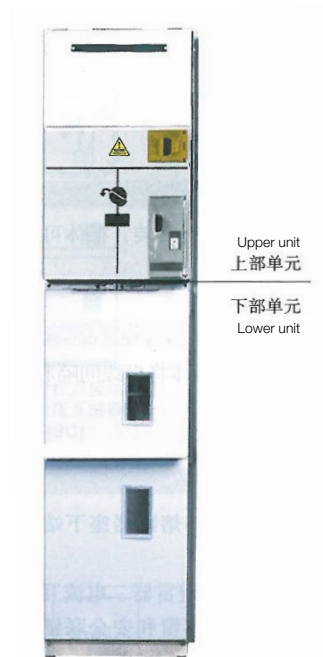
- Schneider AS12 medium-voltage switch
- Three-position switch
- Operating mechanism
- Upper housing
- Low-voltage controlling cubicle
- Interlock device
- Potential indicator
- Bus
- Low-voltage incoming line
- Low-voltage protection

### 下部单元:

- 下部壳体
- 电流互感器
- 电压互感器
- 断路器
- 熔断器
- 避雷器
- 绝缘分压
- 下接地开关
- 电缆底板, 配电缆支撑件

### Lower Unit:

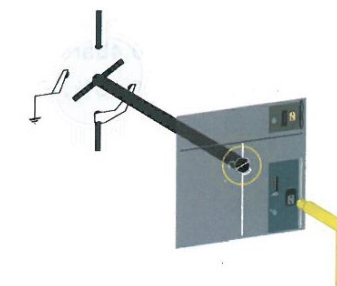
- Lower housing
- Current transformer
- Voltage transformer
- Circuit breaker
- Fuse
- Lightning arrester
- Insulation voltage division
- Lower earth switch
- Cable base plate, with cable rack



## 操作安全性 Operational Safety

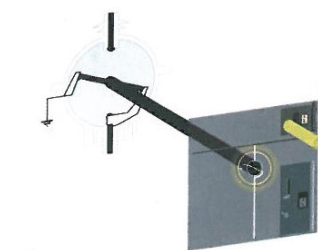
### 可靠的操作系统

- 开关状态同轴显示, 准确无误
- 弹簧储能机构驱动触头转动, 动作速度与操作的人为因素无关
- 接地开关操作孔和主开关操作孔分开, 操作简单明了
- 操作手柄具有防反弹设计, 不仅保证操作开关时只能单方向动作, 而且不会误伤操作者
- 负荷开关柜联锁和隔离开关断路器组合柜联锁符合国家标准
- 挂锁装置能够闭锁主开关或接地开关



### 负荷开关柜联锁

- 开关处于接地位置时, 手柄无法插入主开关操作孔
- 开关从接地位置断开, 方可操作主开关, 此时电缆室前门无法打开
- 主开关处于闭合位置, 手柄无法插入接地开关操作孔, 电缆室前门无法打开
- 打开主开关, 闭合接地开关、才能打开电缆室前门
- 在电缆室前门打开状态下, 主开关被锁定在分闸位置, 只能操作接地开关
- 只有开关处于接地位置时, 才能复位柜门
- 熔断器脱扣跳闸后, 未更换熔断器前、开关柜不能合闸



### Reliable Operating System

- Coaxial displaying of switch states is accurate.
- The spring energy storage mechanism drives the contactor to rotate and the rotating speed is independent of personal factors.
- The operating hole of earth switch and that of main switch are separated, so the operation is simple and clear.
- The operating handle is designed with anti-bounce function, which does not only ensure that the switch can only move to one direction, but also guarantees no inadvertent operator injury.
- Load switch cabinet interlock and the interlock of combination cabinet of disconnecter and circuit breaker conform to national standards.
- The lock-up device can lock main switch or earth switch.

### Load Switch Cabinet Interlock

- When the switch is in grounding position, the handle can not be inserted into the main switch operating hole.
- When the switch breaks from the grounding position, the main switch can be operated and now the front door of cable cubicle can not be opened.
- When the main switch is closed, the handle can not be inserted into the main switch operating hole and the front door of cable cubicle can not be opened.
- First turn on the main switch and turn off the earth switch, and then the cable cubicle front door can only be opened.
- With the front door of cable cubicle opened, the main switch is locked at opening position, so only the earth switch can be operated.
- The cabinet door can be restored only when the switch is in grounding position.
- After the fuse trips, the switchgear can not be turned on before replacing the fuse.



AS12 中压开关  
AS12 Medium-voltage Switch



Fusarc CF 熔断器  
Fusarc CF Fuse



EV12s 真空断路器  
EV12s Vacuum Circuit Breaker



Sepam 数字化多功能保护系列  
Sepam Digital Multipurpose Protection Series

### 隔离开关断路器组合柜联锁

- 使用 50P 锁实现隔离开关和断路器之间的联锁
- 断路器分闸，柜门关上，才能操作隔离开关
- 隔离开关断开，才能闭合接地开关
- 打开柜门的条件
  - 断路器处于断开位置
  - 隔离开关处于断开位置
  - 接地开关处于闭合位置

### Interlock of Combination Cabinet of Disconnector and Circuit Breaker

- Use 50P lock to realize the interlocking between disconnector and circuit breaker.
- The disconnector can only be operated when the circuit breaker is opened and the cabinet door is closed.
- The earth switch can be closed only when the disconnector is opened.
- Conditions for opening the cabinet door
  - The circuit breaker is in "OFF" position.
  - The disconnector is in "OFF" position.
  - The earth switch is in "ON" position.

## AS12 开关 AS12 Switch

### SF6 气体 /SF6 gas

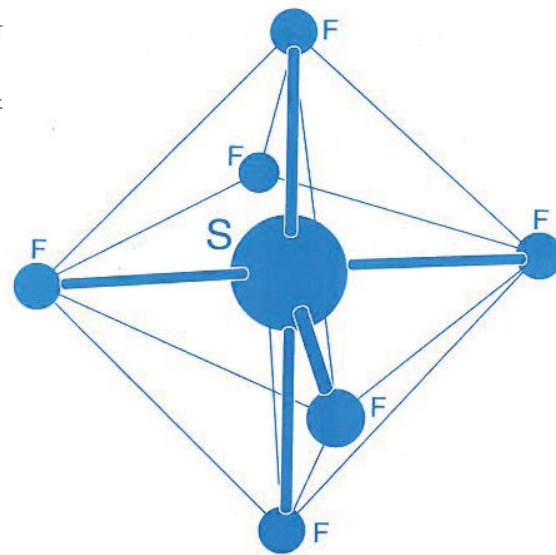
SF6 气体很容易吸附自由电子，具有较强的电负性，因而具有较强的绝缘和灭弧性能。

AS12 开关使用 SF6 气体作为绝缘和灭弧介质，具有良好的开断能力：

- 触头免维护，使用寿命长
- 操作过电压很低
- 操作安全

SF6 gas can easily adsorb free electron with stronger electronegativity, so that it has better insulation and arc extinguishing capacity. Using SF6 gas as the insulation and arc suppressing medium, AS12 switch has good interrupting capacity:

- Maintenance-free contact, with long life
- Operation over-voltage is very low
- Operation safety



### 密封性能

开关三相旋转触头被装入充满 SF6 气体、相对压力 0.4bars 的气室内。气室符合 IEC “密闭压力系统” 要求，年泄漏率小于 0.05%，仅为国标的 1/20。密封性能在出厂前经过严格检验。

### Sealability

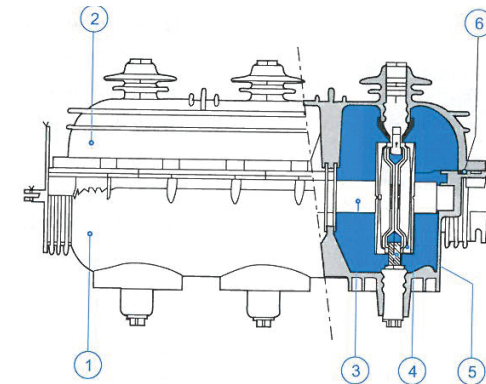
Three-phase rotary contacts of switch is held in the air chamber filled with SF6 gas with relative pressure of 0.4 bar. The air chamber conforms to the requirements of "airtight pressure system" with annual leakage rate less than 0.05% which is only 1/20 of the value specified in national standard. The sealability has been verified strictly before delivery.

### 永磁旋弧开断原理

SF6 气体具有优良的灭弧性能，开关分闸时电弧和气体之间产生相对运动，熄灭电弧。分闸时，动静触头分离，电弧在永久磁铁产生的电磁场作用下，绕静触头旋转，电弧拉长并在电流过零时熄灭。系统简单可靠，灭弧能力强触头磨损很少，电气寿命长。

### Principles of Permanent Magnet Rotating Arc Interrupting

SF6 gas has excellent arc suppressing capability. The relative motion is produced between arc and gas when the switch breaks which is used to extinguish the arc. When opening, the moving and stationary contacts separate and the arc rotates around the static contact under the effect of electromagnetic field generated by permanent magnet, so the arc is elongated and suppressed at the time of zero current. The system is simple and reliable with strong arc suppressing capacity and low contact abrasion and long electric life.



- |         |                      |
|---------|----------------------|
| 1. 壳体   | 1.Housing            |
| 2. 密闭罩  | 2.Enclosed hood      |
| 3. 操作轴  | 3.Operating axis     |
| 4. 静触头  | 4.Stationary contact |
| 5. 动触头  | 5.Moving contact     |
| 6. 密封装置 | 6.Sealing device     |

### 使用安全

- 三位置开关，天然联锁，防止人为误操作
- 开关同时具有开断和隔离功能
- 接地开关具有短路关合能力
- 事故情况下，过压的 SF6 气体冲破安全隔膜后压力下降，气体直接喷向柜体后部，保证柜前人员安全



### Operational Safety

- Three-position switch renders natural interlocking function so as to prevent inadvertent operation.
- The switch has both interrupting and isolation functions.
- The earth switch has short circuit closing capacity.
- In case of accident, overpressure SF6 gas breaks through the safety diaphragm and then the pressure is reduced, the gas directly ejects to the back of cabinet so as to ensure safety of operator working before the cabinet.



## 开关操作机构

## Switch Operating Mechanism

### 产品系列与操作机构 Components and Options of ASGN

产品系列 Product series	CIT	CI1	CI2	CS
ISC	√			
QSC		√		
DSC			√	
CSC,PSC				√
ESC( 隔离开关部分 ) Main deviceESC (Disconnector part)				√+50P 锁 /+50P lock





#### CIT 操作机构

- 使用操作手柄或电机对主开关进行 / 分恰闸操作
  - 开关 (2O+3C) 和接地开关 (1O+1C)
- 使用操作手柄对接地开关进行分 / 合闸操作
  - 开关 (1C) 和接地开关 (1O+1C) (当电动时)
- 辅助触点
- 电机选择
  - 开关 (2O+2C)

#### CIT Operating Mechanism

- Perform OFF/ON operations on the main switch by using operating handle or motor
  - Switch (2O + 3C) and earth switch (1O + 1C)
- Perform OFF/ON operations on the earth switch by using operating handle or motor
  - Switch (1C) and earth switch (1O + 1C) (for power-driven)
- Auxiliary contacts
- Selection of motor
  - Switch (2O + 2C)



#### CI1 操作机构

- 使用操作手柄或电机对主开关进行合闸操作
  - 电动操作时开关 (1C) 和接地开关 (1O+1C)
- 分闸按钮, 熔丝弹跳系统或分励脱扣线圈均能触发分闸挚子, 快速分闸
  - 熔断器熔断 (1C)
- 机械指示 熔断器熔断
- 使用操作手柄对接地开关进行分 / 合闸操作
- 脱扣
  - 分励脱扣
  - 开关 (2O+2C)
  - 电机选择
  - 开关 (2O+3C) 和接地开关 (1O+1C)

#### CI1 Operating Mechanism

- Perform OFF/ON operations on the main switch by using operating handle or motor
  - Switch (1C) and earth switch (1O + 1C)
- Any of opening button, fuse trip system or shunt trip coil can trigger opening detent to realize quick opening.
  - Fusing (1C)
- Mechanical indication: fusing
- Perform OFF/ON operations on the earth switch by using operating handle or motor
- Tripping
  - Auxiliary contacts
  - Shunt trip
  - Switch (2O + 2C)
  - Selection of motor
  - Switch (2O + 3C) and earth switch (1O + 1C)



#### CI2 操作机构

- 合闸操作分为两步, 首先用操作手柄或电机对操作机构储能, 机构储能后可以由合闸按钮或合闸脱扣线圈实现快速合闸
- 分闸按钮或分励脱扣线圈均能实现快速分闸
- 使用操作手柄对接地开关进行分 / 合闸操作
- 辅助触点
  - 开关 (2O+2C)
  - 开关 (2O+3C) 和接地开关 (1O+1C)
  - 电动操作时的开关 (1C) 和接地开关 (1O+1C)
- 脱扣
  - 分励
  - 闭合
  - 分励
- 电机选择

#### CI2 Operating Mechanism

- The opening operation is completed in two steps: first, carry out energy storage for the operating mechanism by operating handle or motor, after energy storage, realize quick opening by opening button or opening trip coil.
- Any of opening button and shunt trip coil can realize quick opening.
- Perform OFF/ON operations on the earth switch by using operating handle or motor
  - Auxiliary contacts
  - Switch (2O + 2C)
  - Switch (2O + 3C) and earth switch (1O + 1C)
  - Switch for power-driven operations (1C) and earth switch (1O + 1C)
- Tripping
  - Shut
  - Closing
  - Shunt
- Selection of motor

#### CS 操作机构

- 使用操作手柄对主开关进行分 / 合闸操作
- 辅助触点
  - 断路器柜隔离开关 (2O+2C)
  - 断路器柜隔离开关 (2O+3C) 和接地开关 (1O+1C)
  - 断路器柜, 电压互感器柜, 中压 / 低压变压器柜的隔离开关 (1O+1C)
- 机械显示
- 电压互感器柜, 中压低压变压器柜的熔断器熔断。

O: 常开  
C: 常闭

#### CS Operating Mechanism

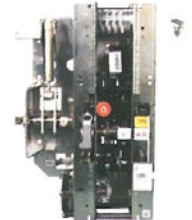
- Perform OFF/ON operations on the main switch by using operating handle or motor
- Auxiliary contacts
  - Disconnecter in circuit breaker cabinet (2O + 2C)
  - Disconnecter in circuit breaker cabinet (2O + 3C) and earth switch (1O + 1C)
- Disconnecter in circuit breaker cabinet, voltage transformer cabinet, medium-voltage / low-voltage transformer cabinet (1O + 1C)
- Mechanical indication
- Fusing of fuses in voltage transformer cabinet, medium-voltage / low-voltage transformer cabinets

O: normally open  
C: normally closed

## EV12s 真空断路器 EV12s Vacuum Circuit Breaker

EV12s 真空断路器采用操作机构和灭弧室前后均衡布置结构, 主导电回路为三相落地式结构, 使用安全可靠。产品达到 M2 机械寿命等级标准和 E2 电气寿命等级标准, 广泛用于保护电缆、架空线、电动机、电容器、变压器、母线单元等。

The EV12s vacuum circuit breaker uses the structure that the operating mechanism and arc chute are equally distributed in front and at back. The main conductive loop uses 3-phase floor-type structure which is safe and reliable. The product meets M2 mechanical life standard and E2 electric life rating standard, widely used for protecting cables, overhead lines, motors, capacitors, transformers, and bus unit etc.



### 高性能的真空灭弧室

- 优化的纵向磁场灭弧技术
- 真空灭弧室内，动静触头选用优质的铜铬合金材料，并开有倾斜方向相同的斜槽。电弧电流流过时，在触头间形成优化的均匀纵向磁场。纵向磁场作用下，迅速将聚集电弧分散到整个触头表面，加大了热量的迅速散失。另外，分散电弧有效利用触头面积，弱化电弧强度，大大减少了对触头的损伤
- 开断次数增加
- 熄弧能力强
- 截流水平低
- 完整的单节磁壳设计和双层叠结构设计，从根本上增强了灭弧室的强度
- 分合闸采用双向缓冲技术，配合优质的波纹管，增加了灭弧室的使用寿命全新一次封排技术，采用特殊焊料和精密的焊接工艺，保证了密封性能和灭弧室的真空度

### High-performance Vacuum Arc Chute

- Optimized longitudinal magnetic field arc suppressing technology
- In the vacuum arc chute, the moving and stationary contacts are made of high-quality copper-chromium alloy materials and designed with chutes that have same inclining direction. When the arc current passes, the optimized uniform longitudinal magnetic field is developed between contacts. In the magnetic field, the accumulated arc is quickly dispersed onto the whole contact surface so as to increase heat dissipation. In addition, the dispersed arc utilizes the contact area effectively, weakens the arc strength and thus greatly reducing damages to the contacts.
- The number of times of interrupting increases.
- The arc extinguishing capacity enhances.
- The cut off level is low.
- The complete single magnetic shell design and double-stacking structural design fundamentally improve the strength of arc chute.
- The opening and closing use two-direction buffer technology with high-quality bellows, which increase the service life of the arc chute. The Complete One-Time Seal-Exhaust Technology is adopted and special solder and precision welding technology, which ensures that sealability and vacuum degree of arc chute.

### 高性能的真空灭弧室

真空灭弧室被纵向安置在相互独立的 EPOXY 绝缘套筒上，能承受高温升。套筒采用先进的 APG 工艺浇注成型，内部结构紧凑，外部表面光滑，增加了爬电距离和绝缘性能。同时，大大减少了粉尘在灭弧室的表面聚集，有效防止了真空灭弧室受外部因素的影响。

### Solid Insulating Sleeve

The vacuum arc chute is arranged longitudinally on EPOXY insulating sleeves which are independent from each other and can withstand high temperature rise. The sleeve is formed by pouring through advanced APG technology. Its internal structure is compact and the outer surface is smooth, which increase the creepage distance and insulating performance. Meanwhile, these features significantly reduces the dust accumulation on the surface of arc chute, and thus effectively preventing that the vacuum arc chute is influenced by external factors.

### 可靠的操作机构

采用具有长时间全球运行经验的操作机构。机构储能弹簧可根据开断容量进行调整，使操作机构的性能和灭弧室所需的触头压力和曲线运动更加匹配，降低了能耗和噪音，并使断路器使用更加安全可靠。

### Reliable Operating Mechanism

The operating mechanism has long-term global operating experiences. Its energy-storage spring can be adjusted based on the interrupting capacity so that the performance of operating mechanics can match the contact pressure required by the arc chute and curve motion in a better manner, which reduce energy consumption and noise and make the circuit breaker more safe and reliable.

## 可选附件电动操作系统

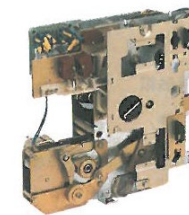
## Optional accessories Electric operating system

### 电动操作系统 Electric Operating System

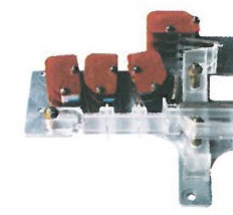
		ISC	QSC	DSC	PSC, CSC	ESC
电机操作系统 Motor operating system	电压 / 功率 Voltage / Power	48VDC/200W 220VAC/200VA	48VDC/200W 220VAC/200VA	24VDC/200		
	储能时间 Energy storage time	<7s				
跳闸线圈 Trip coil	电压 / 功率 Voltage / Power		48VDC/250W 220VAC/750VA	24VDC/200W		
	分闸响应时间 Opening response time		35ms	35ms		
合闸线圈 Closing coil	电压 / 功率 Voltage / Power			24VDC/200W		
	合闸响应时间 Closing response time			55ms		
辅助触点 Auxiliary contacts	主开关 Main switch	(2C + 2O)* 或 (2C + 2O)* + 1C (2C + 2O)* or (2C + 2O)* + 1C	(2C + 2O)* 或 (2C + 2O)* + 1C (2C + 2O)* or (2C + 2O)* + 1C	(2C + 2O)* 或 (2C + 2O)* + 1C (2C + 2O)* or (2C + 2O)* + 1C	1C + 1O	2C + 2O 或 (2C + 2O) + 1C 或 1C + 1O 2C + 2O or (2C + 2O) + 1C or 1C + 1O
	接地开关 Earth switch	1C+1O	1C+1O	1C+1O		1C+1O
	熔丝 Fuse		1C			

说明：如选用电机操作系统，标准配置包括 2C+2O 主开关位置辅助触点如需其他中压等级的电机操作系统，请与施耐德电气联系。

Notes: if the motor operating system is selected, the standard configuration includes 2C + 2O main switch position auxiliary contacts. If other medium-voltage motor operating system is needed, please contact with Schneider Electric.



电操系统  
Electric Operating System



辅助触点  
Auxiliary contacts

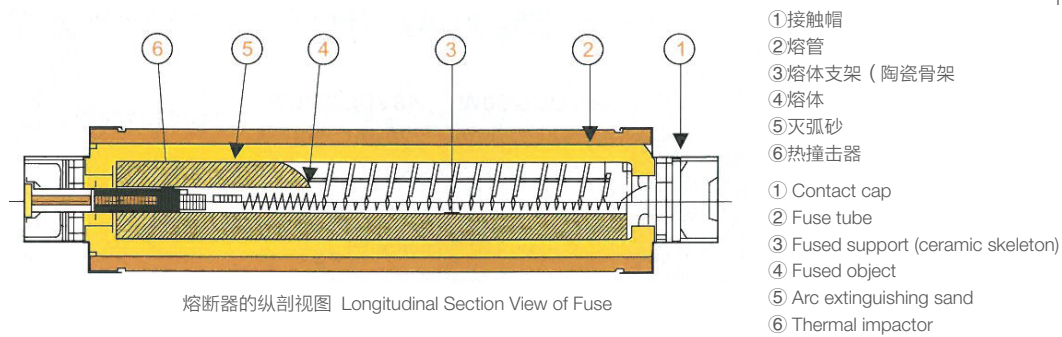


分励脱扣线圈  
Shunt trip coil

## 可选附件施耐德 Fusarc CF 熔断器 Optional Attachments Schneider Fusarc Fuse

施耐德 Fusarc CF 系列熔断器，具有高开断容量和高限流特性，全进 U，配备热撞击器，温升低，适用于中压 12kV-24kV 开关柜。

The Schneider Fusarc CF Series fuse features high interrupting capacity and high current limiting. It is fully imported, equipped with thermal impactor and is suitable for medium-voltage 12kV-24kV switchgear for its low temperature rise.



### 熔断器选择表（额定值 A，无过载，-5℃~40℃） Fuse selection table (A, no overload, -5, ~40)

40℃以上作过流保护用途时，请向我们咨询。

熔丝 工作 变压器额定值 (kVA)

For the purpose of over current protection at 40, please consult us.

Fuse transformer ratings (kVA)

类型 Type	电压 (kV) Voltage (kV)	25	50	100	125	160	200	250	315	400	500	630	800	1000	1250	1600	2000	2500	额定电压 (kV) Rated voltage(kV)	
	3.3	16	25	40	50	50	80	80	100	125	125	160	200							
	5.5	10	16	31.5	31.5	40	50	50	63	80	100	125	125	160	160					7.2
	6.6	10	16	25	31.5	40	50	50	63	80	80	100	125	125	160					
	10	6.3	10	16	20	25	31.5	40	50	50	63	80	80	100	125	125				12
	13.8	6.3	10	16	16	20	25	31.5	31.5	40	50	50	63	80	80	100	125			
	15	6.3	10	10	16	20	25	31.5	31.5	40	50	50	63	80	80	100	125	125		24
	20	6.3	6.3	10	10	16	16	25	25	31.5	40	40	50	50	63	80	100	125		
	22	6.3	6.3	10	10	10	16	20	25	25	31.5	40	40	50	50	80	80	100		

### 热撞击器 Heat striking device

在熔断器中使用热撞击器具有以下优势：

- 与可以自动断开的开关一起，保护熔断器及其周围免受异常温升的危害。对异常的运行条件做出反应：包括频繁或长期过载，或熔断器的选型错误，甚至在安装处的通风条件差等
- 对小于设定的最小开断电流值 I<sub>3</sub> 的过流提供过载指示和保护，该过流会造成危险的高温运行工况
- 降低运行成本，该成本是由于设备损坏的成本或因服务质量下降（维修时间、人员等）造成的额外成本
- 热保护的安全性能，显著降低设备损坏的风险和安装的事故，从而增强配电服务的质量
- 带有热撞击器熔断器的参数（开断容量，熔断器曲线，限定值，撞击力等）与不带热保护的熔断器参数相同。

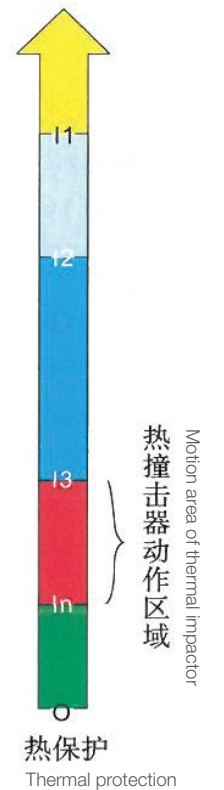
施耐德 Fusarc CF 熔断器标准配置包含热撞击器功能

### Thermal Impactor

Using thermal impactor inside fuse has the advantages as below:

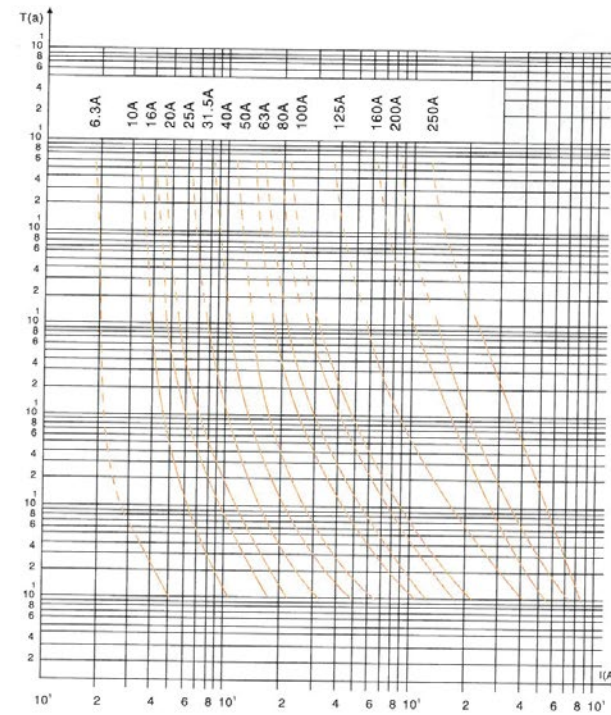
- Protect the fuse and the surrounding from the damages caused by abnormal temperature rise together with the automatic opening switch. Respond to abnormal operating conditions, including frequent or long-term overload or selecting wrong type of fuse, or even bad ventilation conditions in the mounting place.
- Provide overload indication and protection for the overcurrent which is lower than the set minimum interrupting current value I<sub>3</sub>, and this overcurrent would lead to dangerous high-temperature operating conditions.
- Reduce the operating costs which are the extra costs caused by equipment damages or service quality degradation (maintenance time, personnel etc).
- The safety performance of thermal protection significantly reduce the risk of equipment damages and installation accidents so as to enhance the quality of power distribution service.
- The parameters (interrupting capacity, fuse curve, limit value, impact etc) of the fuse with thermal impactor are as same as those of the fuse without thermal protection capacity.

The Schneider Fusarc CF fuse contains thermal impactor function as standard.



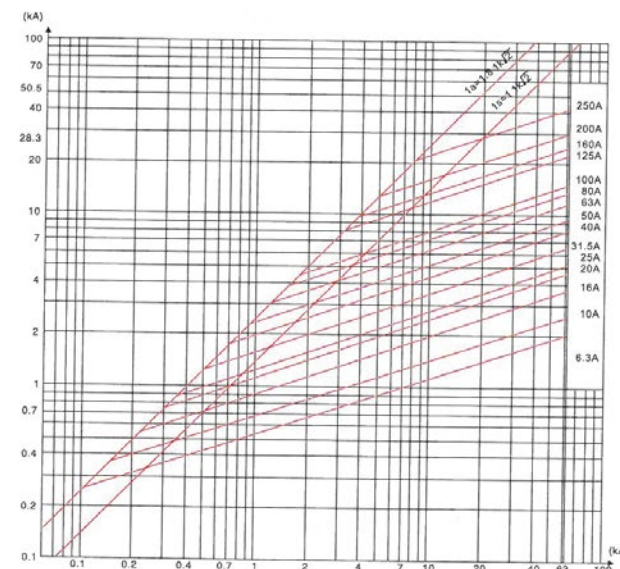


## 可选附件 Fusarc CF 熔断器 Optional accessories Fusarc CF fuses



Fusarc CF 熔断器 时间—电流曲线  
Fusarc CF Fuse Time-Current Curve

Fusarc CF 熔断器 时间—电流曲线



Fusarc CF 熔断器 限流曲线  
Fusarc CF Fuse Current Limiting Curve

Fusarc CF 熔断器 限流曲线

## 可选附件 故障指示器 & 远程控制终端监控单元 Optional Attachments Fault Indicator and Remote Control Terminal Monitoring Unit

### Flair22D 故障指示器

使用施耐德 Flair 22 D 自充电式故障指示器建立人工电网故障查询系统。在开关柜、环网柜进出线上加装故障指示器，能迅速、准确地定位故障，减小停电面积，减少停电时间。

- 自充电式
- 4 位液晶显示
- 前面板按钮操作
- 监测接地故障和过流故障
- 双电源
- 电流表功能
- 本地、远程均可复位
- 预留 SCADA 传输接口

### Flair 22D Fault Indicator

The Schneider Flair 22D self-charging fault indicator establishes power grid fault manual query system. Adding fault indicator to switchgear and incoming and outgoing lines of ring main unit can quickly and accurately locate the fault so as to reduce power failure influence area and shutdown.

- Self-charging
- 4-digit LCD display
- Front panel button operations
- Monitoring earth fault and overcurrent faults
- Double power supplies
- Ampere meter function
- Resetting is available for both local and remote
- SCADA interface is reserved

### Talus200 远程控制终端监控单元

T200 是中压变电站二次配电网的终端控制单元，可使中压变电站实现远程控制及电网自动化管理。机箱由不锈钢板制成，体积小，并符合 EMC 标准。可带挂锁装置。

T200 远程终端设备包括 3 种基本模块：电源模块、通讯模块、当地控制和操作模块，可以实现以下功能：

- 与控制中心通讯，多种通讯方式包括光纤通讯、GPRS、CDMA、GSM 等
- 电流 / 电压测量
- 提供电动操作机构 48VDC 工作电源
- 1-16 路中压开关工作状态监控
- 相间故障检测
- 接地故障检测
- 本地显示和控制
- 故障隔离
- 电网重构
- 双电源切换及备用电源自投

### Talus 200 Remote Control Terminal Monitoring Unit

T200 is a terminal control unit in secondary power distribution network of medium-voltage substation, which allows the medium-voltage substation to realize remote control and power grid automatic management. The chassis is made of stainless steel plates, which is compact and conforms to EMC standard. The locking device is optional.

T200 remote terminal equipment is composed of three basic modules: power supply module, communication module, local control and operating modules. The following functions can be realized:

- Communicate with the centre in multiple ways such as optical fiber communication, GPRS, CDMA, GSM
- Current / Voltage measuring
- Provide electric operating mechanism 48VDC working power supply
- 1-16 ways medium-voltage switch operating status monitoring
- Phase-to-phase fault detection
- Earth fault detection
- Local display and control
- Fault isolation
- Reconfiguration of power grid
- Switching between the two power supplies and self-operating standby power supply

T200 远程终端单元分布在网络中，安装在开关装置的旁边，作为“电网远动系统的永久性传感器和执行器”。

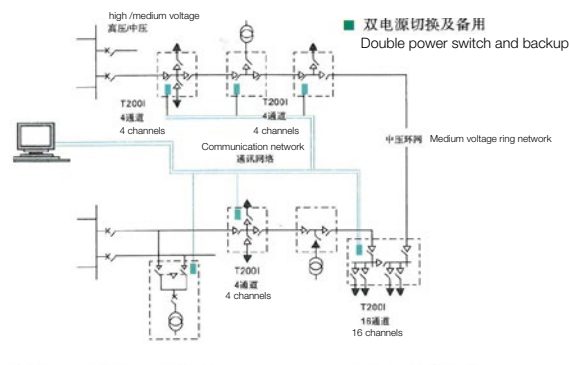
T200 remote terminal units are distributed in the network and installed next to switch device as “permanent sensor and actuator in the power grid remote-action system”.



壁挂式 金属机箱  
Wall-mounted metal chassis



故障指示器  
Fault Indicator



High voltage/medium voltage  
4 channels  
4 channels  
Communication network  
Medium voltage ring network  
4 channels  
16 channels

### 可选附件 钥匙闭锁装置

### Optional Attachments Key and Locking Device

#### A1

当低压柜开关未锁定在“断开”或“隔离”位置时，防止变压器保护柜的接地开关闭合。

#### C1

如变压器保护柜的接地开关未闭合，应防止接触变压器。

#### C4

当低压柜开关锁定在“断开”或“隔离”位置时，才能使变压器保护柜的接地开关闭合。如变压器的接地开关未闭合，应防止接角 III 变压器。

#### A3

只有线路侧开关柜锁定在“断开”或“隔离”位置时，负载侧的接地开关才能闭合。

#### A4

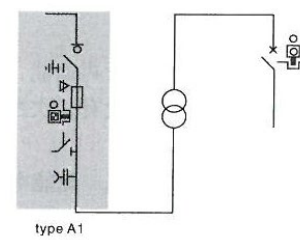
防止两个开关同时闭合。

#### P1

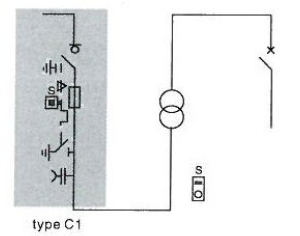
如本开关未锁定在断开位置，应防止另一柜的接地开关闭合。

#### 3 锁 2 钥匙

子 CIT 机构，3 个开关柜中只能有两台开关柜处于闭合状态。



type A1



type C1

#### A1

When the low-voltage switchgear switch is not locked at “interrupting” or “isolating” positions, prevent the earth switch of transformer protection cabinet from closing.

#### C1

If the earth switch of transformer protection cabinet is not closed, prevent contacting with transformer.

#### C4

The earth switch of transformer protection cabinet can only be closed when the low-voltage switchgear switch is locked at “interrupting” or “isolating” positions.

If the earth switch of transformer is not closed, prevent contacting with transformer.

#### A3

The earth switch of load side can only be closed when the line side switchgear is locked at “interrupting” or “isolating” positions.

#### A4

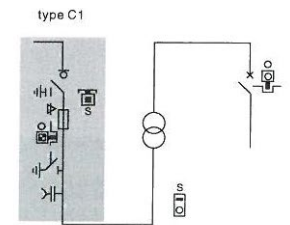
Prevent simultaneous closing of both switches.

#### P1

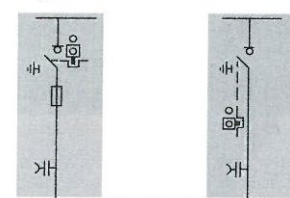
If the switch is not locked at “interrupting” position, prevent the earth switch of another cabinet from closing.

#### 3 Locks 2 Keys

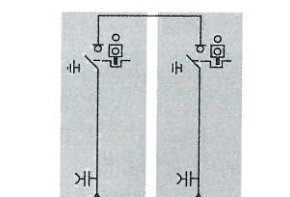
Used for CIT mechanism, among the 3 switchgears, only 2 of them are closed.



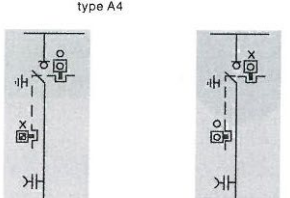
type C1



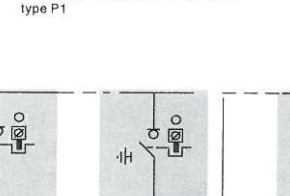
type C4



type A3



type A4



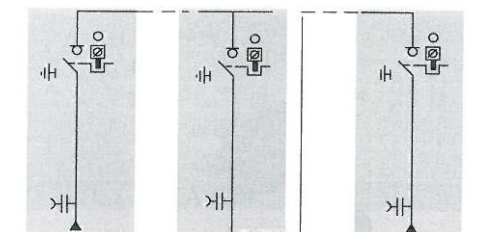
type P1

#### 钥匙式互置装置图例

- 无钥匙 No key
- 可取钥匙 Key is available
- 固定钥匙 Fixed key
- 板或门 Plate or door

#### Legends of Key-type interchangeable device

- No key
- Key is available
- Fixed key
- Plate or door



## 可选附件 EV12s 可选附件 Optional annex EV12s optional accessories

### 储能电机 (M)

RI 单元对储能弹簧进行储能，并在断路器合闸操作后进行再储能，为断路器闸后立即进行重合闸操作准备。手动储能手柄仅用于没有二次控制电压时的后备控制。

RI 储能单元装有 3 个标准的限位开关，用以指示机构的储能状态。储能电机可以交直流通用。

### Energy storage motor (M)

RI energy storage unit performs energy storage for spring and a second energy storage after the circuit breaker closes so as to prepare for circuit breaker reclosing after opening. Manual energy storage handle is only used in backup device without secondary control voltage.

RI energy storage unit is equipped with 3 standard limit switches, used for indicating the energy storage status of mechanism. The energy storage motor can be used in AC or DC conditions.

特性 Characteristics			
电源 50Hz Power supply 50Hz	VAC	110	220
	VDC	110	220
动作值 Operating value		85-110%	
功率 (VA 或 W) Power (VA or W)		390VA	
储能时间 Energy storage time		< 15s	



### 合闸线圈 (YF)

当储能机构储能完毕后，该线圈可用于远程控制断路器合闸。

### Closing coil (YF)

When the energy storage mechanism finishes energy storage, the coil can be used to remotely control the closing of circuit breaker.

YF 特性 YF Characteristics			
电源 50Hz Power supply 50Hz	VAC	110	220
	VDC	110	220
动作值 Operating value		85-110%	
功率 Power	(VA 或 W)	180VA	
起动电流 Starting current	DC	0.9A±0.05A	
	AC	0.80A±0.05A	



## 可选附件 EV12s 可选附件 Optional Attachments EV12s Optional Attachments

### 分闸线圈 (Y01)

该脱扣器通电时，可立即引发断路器分闸。

注：分闸线圈不可以交直流通用。

### Opening coil (Y01)

When the trip is energized, it can trigger opening of the circuit breaker.

Note: the opening and closing coils can not be used in both AC and DC conditions.

Y01 特性 Y01 Characteristics			
电源 50Hz Power supply 50Hz	VAC	110	220
	VDC	110	220
动作值 Operating value	DC	65-120%	
	AC	85-120%	
功率 Power (VA or W)	(VA 或 W) (VA or W)	180VA	
起动电流 Starting current	DC	0.9A ± 0.05A	
	AC	0.80A ± 0.05A	

### 欠压分励脱扣器 (YM)

当该脱扣器的电压降低到额定电压的 35% 时，欠压分励脱扣器动作会引起断路器跳闸。如果该脱扣器没有加电，则任何合闸指令（手动，电动）都不执行。当该脱扣器上的电压超过其额定值的 85% 时，合闸才可以进行。

### Undervoltage shunt trip (YM)

When voltage of this trip drops to 35% of rated current, the undervoltage shunt trip will act to cause tripping of circuit breaker. If the trip is not energized, no closing command will be performed (manual, electric). The closing operation can be performed only when the voltage of this trip is higher than 85% of its rated value.

YM 特性 YM Characteristics			
电源 50Hz Power supply 50Hz	VAC	110	220
	VDC	110	220
动作值 Operating value	分闸 Opening	< 35%	
	合闸 Closing	> 85%	
功率 Power	(VA 或 W) (VA or W)	180VA	



## 可选附件 EV12s 可选附件 Optional Attachments EV12s Optional Attachments

### 脱扣器延时单元

消除因瞬间电压下降而使 YM 动作产生错误分闸。

#### Components and Options of ASGN Switchgear

Eliminate that instantaneous voltage drop may cause YM actions which lead to wrong opening.

特性 Characteristics			
电源 50Hz Power supply 50Hz	VAC	110	220
	VDC	110	220
额定电压断路器响应时间 Rated voltage circuit breaker response time		0.05s~10min	



### 第二分闸线圈

该脱扣器通电时，可立即引发断路器分闸，可实现远方分闸断路器的功能。

#### The Second Opening Coil

When the trip is energized, it can immediately trigger opening of the circuit breaker to realize the functions of remote opening circuit breaker.

特性 Characteristics			
电源 50Hz Power supply 50Hz	VAC	110	220
	VDC	110	220
动作值 Operating value	DC	65-120%	
	AC	85-120%	
功率 Power	(VA 或 W) (VA or W)	180VA	



### 断路器辅助接点 (QF)

该开关指示断路器分“合”状态，它采用旋转式切换开关，直接由断路器机构带动。

#### Auxiliary Contact of Circuit Breaker (QF)

This switch, indicating the “opening” and “closing” status of circuit breaker, is rotary switch directly driven by circuit breaker mechanism.

QF 特性 QF Characteristics		
节点容量 (A) Contact capacity (A)	DC	2A
	AC	10A

注：标准配置数，参照二次原理图

Note: standard value, refer to secondary schematic diagram



### 电机储能完毕开关 (M1 ~ M5)

该开关用来指示弹簧是否储能完毕。

#### Switch of Motor Energy Storage Finishing (M1~M5)

This switch indicates whether the spring finishes energy storage.

特性 Characteristics		
节点容量 (A) Contact capacity (A)	DC	5A
	AC	10A

注：标准配置数，参照二次原理图 Note: standard value, refer to secondary schematic diagram



### 动作计数器

动作计数器可以从前面板上看到，它累计断路器所进行的操作循环数。

#### Operation Counter

The operation counter can be seen from the front panel, which records operation cycle times performed by circuit breaker in an accumulative manner.



### 断路器钥匙锁

该钥匙锁可对断路器或断路器间进行锁分锁合及互锁的功能。

#### Circuit Breaker Key and Lock

The key and lock can lock, unlock and interlock circuit breaker or among circuit breakers.



## 可选附件 SEPAM 系列综合继电保护装置

### Optional Attachments

#### SEPAM Series Comprehensive Relay Protection Device

Sepam 系列微机继电保护产品是为各种电压等级的工业设施和公共变电站中电力设备和配电网的运行而设计。

Sepam series microcomputer relay protection product is designed for operation of power equipments and power distribution network of industrial facilities and public substations with different voltage ratings.



### 产品特点

- 中文化液晶显示的人机界面，专为中国用户定制，方便用户的使用
- 内置编程功能，可根据用户需要完成各种工艺连锁，如自备投及自减载等自动化功能
- 大量的可靠性研究 (FMECA) 及测试可确保 Sepam 在强电磁场干扰等恶劣环境中可靠工作
- 模块化设计，功能可由选装模块的增加而增强，既能够使得用户初期选用时低成本的投资，又能满足于方便扩展的需要

它提供全面、简单而可靠的解决方案，适用于以下情况：

- 变电站的保护（进线和出线）
- 变压器的保护
- 电动机的保护
- 发电机的保护
- 母线保护

### Product Features

- Chinese LCD MMI, especially customized for Chinese users, is user friendly.
- The built-in programming function can perform various process interlocking based on user requirements, such as self-operation and self deloading and other automatic functions.
- A great deal of reliability studies (FMECA) and tests can guarantee that Sepam works reliably in severe environment with strong electro magnetic interference.
- The modular design allows that the functions can be enhanced with increase of optional modules, which realizes that the user can use low investment at beginning and satisfies the needs of extension.

It provides comprehensive, simple and reliable solutions, which apply to the following conditions:

- Protection of substation (incoming and outgoing lines)
- Protection of transformer
- Protection of motor
- Protection of generator
- Protection of bus

### Sepam 20 和 40 系列选型指南

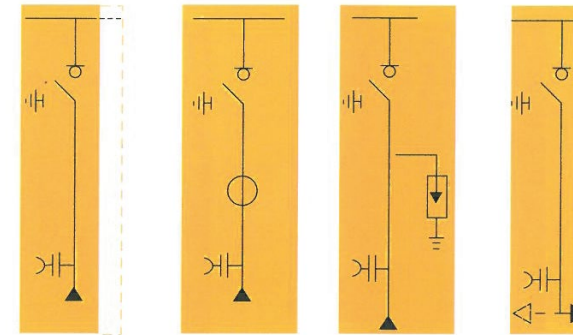
Guide for Selections of Sepam 20 and 40 Series

	传感器 (1) Sensor (1)	特殊保护功能 (2) Special protective functions (2)	变电站 Substation	变压器 Transformer	电动机 Motor	发电机 Generator	母线 Bus
Sepam 20 系列 10 输入 / 8 输出 1 个通讯口 Sepam 20 Series 10 input / 8 output	3I+I0		S20	T20	M20		B21
	3V+V0	81R					B22
Sepam 40 系列 10 输入 / 8 输出 1 个通讯口逻辑等式编程 Sepam 40 Series 10 input / 8 output 1 communication port Logical equation programming	3I+I0 3V		S40	T40		G40	
		67N 67 67N	S41/S43 S42		M41 T42		

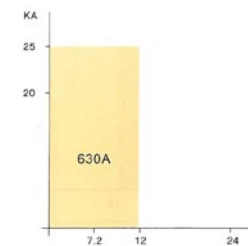
1. 传感器 I 表示为相电流互感器；I0 表示为零序电流互感器；V 表示为相电压互感器，V0 表示为零序电压互感器。
2. 特殊保护器功能中 81R 为频率改变率即滑差保护；67 为相过流保护；67N 为方向性接地保护。

1. The sensor I indicates phase current voltage; I0 indicates zero sequence current transformer; V indicates phase voltage transformer, V0 indicates zero sequence voltage transformer.
2. For special protector functions, 81R is frequency change rate, i.e. slip frequency protection; 67 is directional phase overcurrent protection; 67N is directional grounding protection.

### 进出线柜 (ISC) Import and export cabinet(ISC)



### 电气特征 Electrical characteristics



#### 基本设备

- 开关和接地开关
- 三相母线
- CIT 操作机构
- 带电指示器
- 50W 加热器

#### Basic equipments

- Switch and earth switch
- 3-phase bus
- CIT operating mechanism
- Potential indicator
- 50W heater

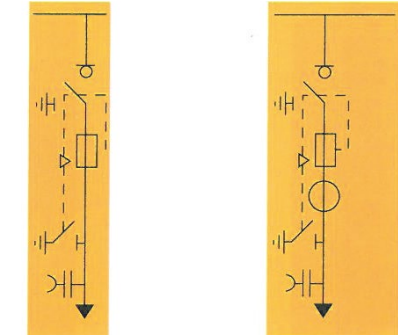
#### 可选择的附件

- 电动操作机构
- 辅助触点
- 钥匙式闭锁
- 底座
- 相序仪
- 故障显示器
- 干式单芯电缆双连接装置
- 顶部低压间
- 避雷器
- 电流互感器
- 三相底部母线

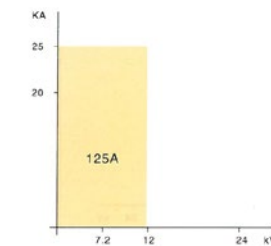
#### Optional Attachments

- Electric operating mechanism
- Auxiliary contact
- Key-type lock
- Base
- Phase sequence indicator
- Fault indicator
- Dry-type single-core cable double connection device
- Low-voltage cubicle on the top
- Lightning arrester
- Current transformer
- 3-phase bottom bus

### 负荷开关 -- 熔断器组合柜 (QSC) Load Switch - Fuse Combination Cabinet (QSC)



### 电气特征 Electrical characteristics



#### 基本设备

- 开关和接地开关
- 三相母线
- CIT 操作机构
- 熔断器熔断机械显示器
- 带电显示器
- 50W 加热器
- 下部接地开关
- DIN 装针式熔断器

#### Basic equipments

- Switch and earth switch
- 3-phase bus
- CIT operating mechanism
- Mechanical indicator for fusing
- Potential indicator
- 50W heater
- Bottom earth switch
- DIN striker-type fuse

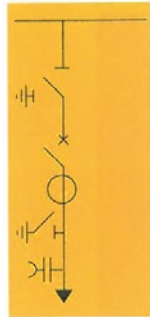
#### 可选择的附件

- 带分励脱扣的电动操作机构
- 辅助触点
- 钥匙式闭锁
- 底座
- 熔断器熔断辅助触点
- 分励脱扣或欠压脱扣
- 低压间
- 相序仪
- 故障显示器
- 电流互感器

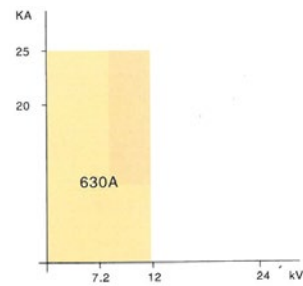
#### Optional attachments

- Electric operating mechanism with shunt trip
- Auxiliary contact
- Key-type lock
- Base
- Auxiliary contact for fusing of fuse
- Shunt trip or undervoltage trip
- Low-voltage cubicle
- Phase sequence indicator
- Fault indicator
- Current transformer

## 隔离开关 + 断路器柜 (ESC) Isolation switch + circuit breaker cabinet (ESC)



### 电气特征 Electrical characteristics



#### 基本设备

- EV12s 真空断路器
- 隔离开关和接地开关
- 三相母线
- 断路器操作机构 CS
- 带电指示器
- 低压间
- 电流互感器
- 断路器辅助触点
- 50W 加热器
- 隔离开关断路器间连锁

#### Basic equipments

- EV12s vacuum circuit breaker
- Disconnecter and earth switch
- 3-phase bus
- Circuit breaker operating mechanism CS
- Potential indicator
- Low-voltage cubicle
- Current transformer
- Circuit breaker auxiliary contact
- 50W heater
- Interlock between disconnecter and circuit breaker

#### 可选择的附件

- 柜
- 隔离开关辅助触点
- Sepam 保护装置
- 钥匙式闭锁
- 底座
- 断路器
- 欠压分励脱扣器
- 脱扣器延时单元
- 第二分闸线圈
- 断路器辅助触点

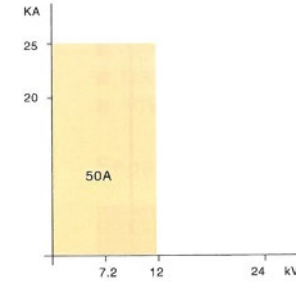
#### Optional Attachments

- Cabinet
- Disconnecter auxiliary contact
- Sepam protection device
- Key-type lock
- Base
- Circuit breaker
- Undervoltage shunt trip
- Trip delay unit
- The second opening coil
- Circuit breaker auxiliary contact

## 电压测量柜 (PSC) Voltage metering cabinet (PSC)



### 电气特征 Electrical characteristics



#### 基本设备

- 隔离开关和接地开关
- 三相母线
- 操作机构 CS
- 低压电路隔离开关
- 低压熔丝
- 50W 加热器
- 三个 6.3A 型熔断器 (中性点接地系统)
- 两个电压互感器 (中性点绝缘系统)
- 熔断器熔断显示

#### Basic equipments

- Disconnecter and earth switch
- 3-phase bus
- Operating mechanism CS
- Disconnecter for low-voltage circuit
- Low-voltage fuse
- 50W heater
- Three 6.3A fuses (neutral point earth system)
- Two voltage transformers (neutral point insulation system)
- Indicator for fusing

#### 可选择的附件

- 辅助触点
- 低压间
- 底座

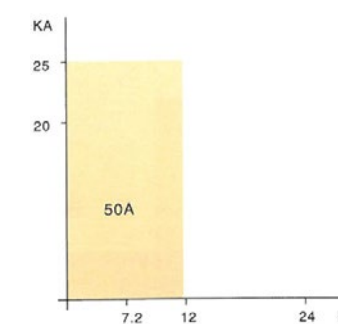
#### Optional Attachments

- Auxiliary contact
- Low-voltage cubicle
- Base

## 中压低压变压器柜 (CSC) Medium voltage transformer cabinet (CSC)



### 电气特征 Electrical characteristics



#### 基本设备

- 隔壁开关和接地开关
- 操作机构 CS
- 三相母线
- 两个熔断器
- 一个电压互感器 (相-对-相)
- 熔断器熔断显示器
- 50W 加热器

#### Basic equipments

- Disconnecter and earth switch
- Operating mechanism CS
- 3-phase bus
- Two fuses
- One voltage transformer (one-to-one phase)
- Indicator for fusing
- 50W heater

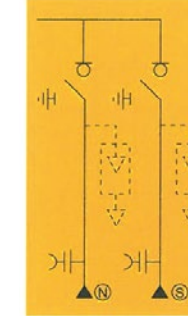
#### 可选择的附件

- 辅助触点
- 低压间
- 钥匙式闭锁
- 底座
- 扩大型低压间

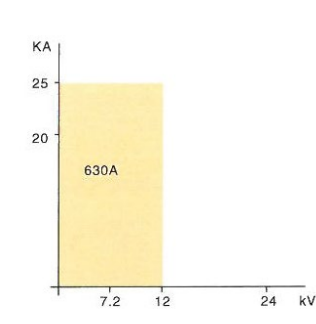
#### Optional Attachments

- Auxiliary contact
- Low-voltage cubicle
- Key-type lock
- Base
- Expanded low-voltage cubicle

## 双电源进线柜 (DSC) Incoming cabinet with double power supply (DSC)



### 电气特征 Electrical characteristics



#### 基本设备

- 开关和接地开关
- 三相母线
- 带电指示器
- 操作机构 C12 带 24V DC 电操
- 机构及分励脱扣器
- 50W 加热器
- 低压间
- 备自投装置

#### Basic equipments

- Switch and earth switch
- 3-phase bus
- Potential indicator
- Operating mechanism C12, with 24V DC electric mechanism and shunt
- Trip
- 50W heater
- Low-voltage cubicle
- Self-operating device

#### 可选择的附件

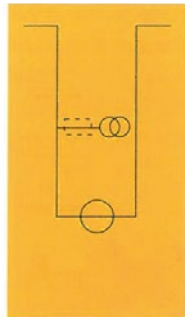
- 避雷器
- 底座

#### Optional Attachments

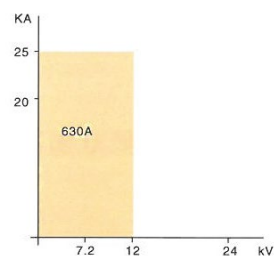
- Lightning arrester
- Base



### 电流电压计量柜 (GC) Current and voltage metering cabinet (GC)



#### 电气特征 Electrical characteristics



#### 基本设备

- 一至三个电流互感器
- 接线母线
- 三相母线
- 低压间
- 三个电压互感器 (相对地) 或二个电压互感器 (相对相)
- 保护 PT 的熔丝及其支架

#### Basic equipments

- 1 to 3 current transformer
- Earth bus
- 3-phase bus
- Low-voltage cubicle
- 3 voltage transformers (phase to earth) or 2 current transformers (phase to phase)
- Fuse and support for protecting PT

#### 可选择的附件

- 辅助柜

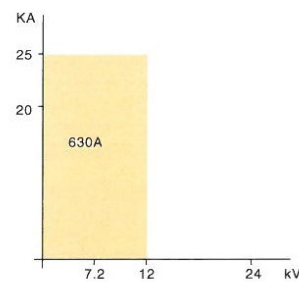
#### Optional Attachments

- Auxiliary cabinet

### 母线升高柜 (GB) Bus lifting cabinet (GB)



#### 电气特征 Electrical characteristics



#### 基本设备

- 接线母线
- 出线母线 (左或右)

#### Basic equipments

- Earth bus
- Outgoing bus (left or right)

#### 可选择的附件

- 低压间

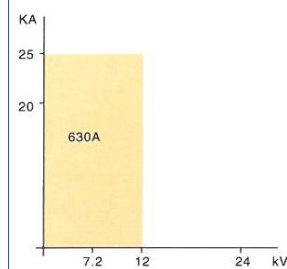
#### Optional Attachments

- Low-voltage cubicle

### 进线电缆连接柜 (GA) Incoming cable connection cabinet (GA)



#### 电气特征 Electrical characteristics



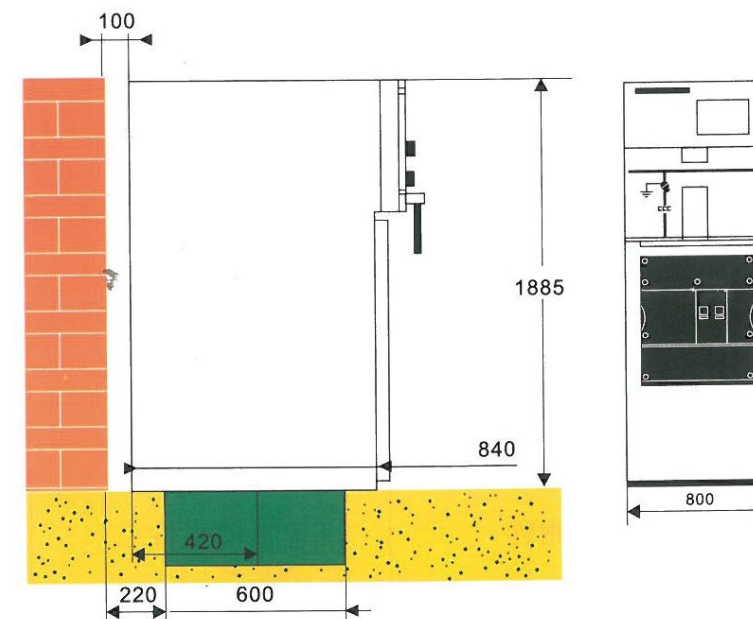
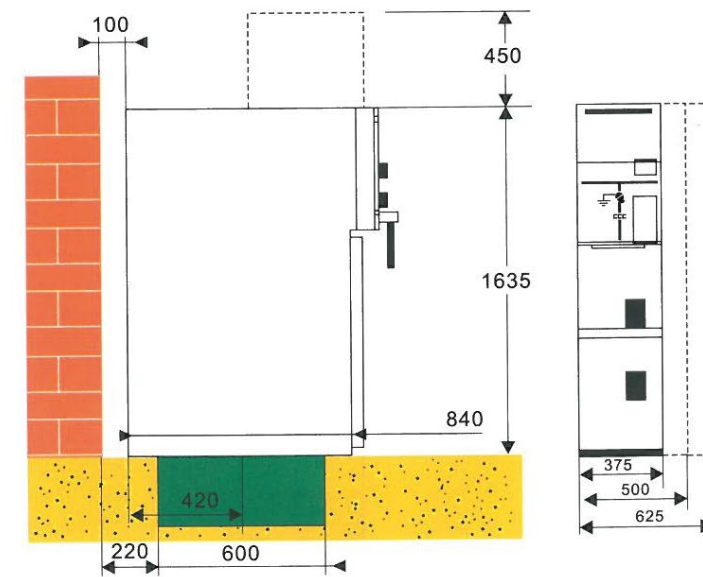
#### 基本设备

- 三相母线
- 带电显示器
- 接线母线

#### Basic equipments

- 3-phase bus
- Potential indicator
- Earth bus

### 开关柜外形尺寸 Switch cabinet



## 安装及电缆接线

### Installation and Cable Wiring

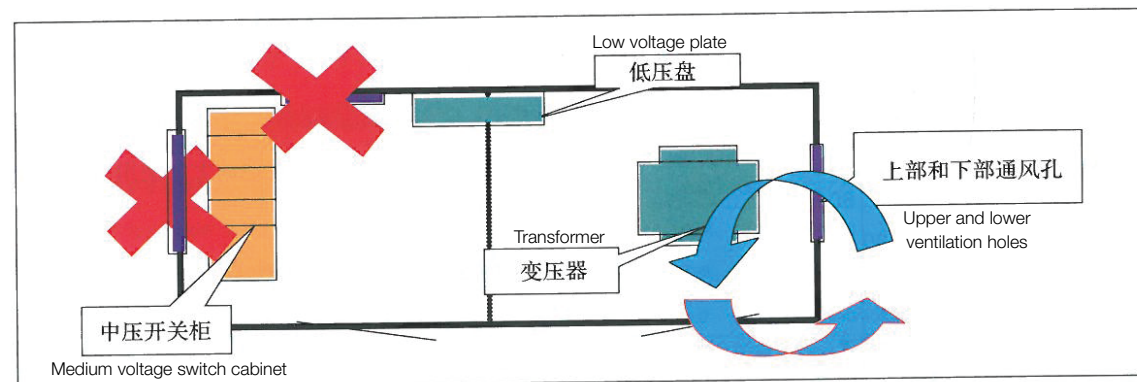
#### 开关柜安装建议

- 设计恰当的变电站通风，防止通风口留得过大和强迫通风。并注意通风口的位置，位置不当会引起对流，从而破坏柜体与周围环境的热平衡。
- 防止电缆沟积水
- 24 小时使用防潮电加热，不要使用湿度控制器控制电加热
- 比较潮湿的地区，可采用封闭底板，和在主母线室后板加开适当通风孔

#### Switchgear installation suggestion

Proper ventilation design in substation, prevent the vents stay too large and forced ventilation. And pay attention to vent position, position will cause the convection, thus undermining the cabinet with the surrounding environment of the heat balance.

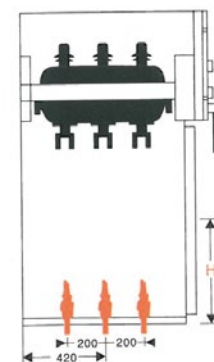
- prevent cable trench water
- 24 hours use moisture-proof electric heating, do not use a humidity controller to control electric heating
- In humid areas, can be used in closed bottom, and a main bus chamber after additional appropriate ventilation holes



## 电缆接线高度从地面测量

### Cable connection height from ground survey

ISC( 柜内不安装浇铸式 CT) ISC (no casting CT is installed inside the switchgear)	750
DSC( 柜内不安装浇铸式 CT) DSC (no casting CT is installed inside the switchgear)	750
QSC	535
ISC( 柜内安装浇铸式 CT) ISC (Casting CT is installed inside the switchgear)	≥ 600
DSC( 柜内安装浇铸式 CT) DSC (Casting CT is installed inside the switchgear)	≥ 600
ESC	420



## 柜体固定

### The cabinet is fixed

#### 地面准备

开关柜可安装在普通的混凝土地板上，电缆沟尺寸取决于连接电缆的型号和截面。630A 以下的柜子其土木工作量都是一样的，若电缆沟深度降低 400mm，则柜体可安装在预浇注的混凝土底座上，从而可取消电缆沟，这样：

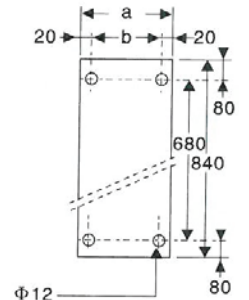
- 室内安装不需要电缆沟
- 不会影响变电站开关的操作

#### Ground preparation

Switch cabinet can be installed on the ordinary concrete floor, cable groove size depends on the type and cross section of the connecting cable. Below the cabinet of the following 630A its civil work load is the same, if the cable trench depth is reduced by 400mm,

The cabinet can be installed on a concrete base is pre cast, thereby removing the cable trench, such:

- Indoor installation does not need cable trench
- Will not affect the operation of the Substation Switch



a ( mm )	375	500	625	800
b ( mm )	335	460	585	760

注：在断路器或接触器柜内，紧固件安装在柜的下侧  
Note: the fasteners are installed in the upper part inside the circuit breaker or contractor cabinet.

#### 柜的固定

柜间

将柜简单地用螺栓固定在地面上，使用扭矩为 28Nm 的扳手进行柜间的母线连接。

#### Cabinet fixed

Cabinet

The cabinet will simply use the bolt fixed on the ground, using the 28Nm torque wrench cabinet ask Bus connection.

#### 在地面上

- 对于不超过三个柜体组成的配电系统，则四个角需要用以下措施拧紧在地面上：
  - 用专用工具把螺母埋入水泥地再用螺钉固定
  - 或用螺栓浇入水泥地中
- 对于由三个以上柜组成的配电柜，固定点的数目和位置取决于当地标准（抗震性能等），每一柜可根据需要选择
- 紧固孔 b 的位置取决于柜体的宽度

#### On the ground

- The distribution system is not more than three cabinet, the four need to use the following measures to tighten the angle on the ground:
  - With special tools, the nut is embedded in the cement ground with screws.
  - Or cast into the concrete floor with bolts
- For distribution cabinet consisting of more than three cabinets, the number and location of the fixed points are determined by the local standard (seismic performance, etc.), each cabinet can be selected according to the need
- Position fastening hole B in cabinet width

