

DQS系列SF6全绝缘充气环网柜

DQS Series SF6 Gas-insulated Ring-Main Unit

12-24kV,...630A,...20kA,25kA



江苏大全长江电器股份有限公司

JIANGSU DAQO CHANGJIANG ELECTRIC CO.,LTD.



DQS系列SF6全绝缘充气环网柜

高可靠性

免维护

小

DQS系列SF6全绝缘气体绝缘环网柜（以下简称环网柜）是大全集团引进先进的技术理念和领先的生产加工工艺，自行研发成功的新一代12/24kV气体绝缘环网柜。产品具有体积小，免维护，操作简单，安全可靠，性能优异等特点，特别适用于电力系统城网改造，工业配电站和负荷中心电站，高层建筑，户外开闭所，箱式变电站等场所使用。

产品通过国家高压电器质量监督检验中心（西高所）权威认证和ASTA/TUV。

DQS series of SF6 gas-insulated Ring M gas-insulated extendable type and compa introduce advanced design concepts,process technology.Features include compact design easy operation,excellent electrical and mec RMUs are widely used in commercial and in buildings,outdoor switchgear and Box-type s

The DQS series RMU has already successf



环网柜

型化

Main Units (RMU) are the new 12/24kV SF6 compact modular type switchgear. The products using technology and advanced manufacturing technology, virtually maintenance-free, with simple mechanical functions as well as high reliability. They are suitable for industrial power distribution systems, high rise substations. They have fully been type tested in XIHARI ASTA and TUV.

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荣誉与资质 Honor and Qualification

- ◆ 企业营业执照 ◆ Business License
- ◆ 质量管理体系认证证书 ◆ Quality Management System Certificate
- ◆ 环境管理体系认证证书 ◆ Environmental Management System Certificate
- ◆ 职业健康安全管理体系认证证书 ◆ Occupational Health and Safety Management System Certificate
- ◆ 企业资信等级证书 ◆ Enterprise Credit Rating Certificate
- ◆ 高新技术企业证书 ◆ High-Tech Enterprise Certificate
- ◆ 能源管理体系认证证书 ◆ Energy Management System Certificate
- ◆ 工信安全 ◆ Industrial Information Security
- ◆ 检验报告 ◆ Test Report





使用环境 Service Conditions

- | | |
|--|---|
| <ul style="list-style-type: none"> ■ 环境温度： <ul style="list-style-type: none"> — 最高环境温度 +40°C — 最低环境温度（户内） -40°C ■ 环境湿度： <ul style="list-style-type: none"> 24小时测量 ≤95% 1个月测量 ≤90% ■ 海拔高度≤4500m ■ 大气环境：不受污秽、烟尘、腐蚀性或可燃气体、烟雾等环境因素影响。 ■ 地震烈度：不超过8度
注：海拔高度超过2000m，在订货时需要用户与制造商协商处理。 | <ul style="list-style-type: none"> ■ Ambient temperature <ul style="list-style-type: none"> —Max. +40°C —Min.(indoor) -40°C ■ Humidity <ul style="list-style-type: none"> Max. Daily average relative humidity ≤95% Max. Month average relative humidity ≤90% ■ Altitude ≤4500m ■ Ambient air: Not affected by pollution, smoke, corrosive or combustible gas, salt spray and other environment. ■ Earthquake intensity: less than 8 magnituded
Note: If the altitude is more than 2000m, the user needs to negotiate with the manufacturer when ordering. |
|--|---|

标准及规范 Standards and Specifications

- | | |
|---|--|
| <ul style="list-style-type: none"> ■ GB/T 3906 《3.6 ~ 40.5kV 交流金属封闭开关设备和控制设备》 GB/T11022 《高压开关设备和控制设备标准的共同技术要求》 GB 1984 《高压交流断路器》 ■ GB 1985 高压交流隔离开关和接地开关》 GB 3804 《3.6 kV ~ 40.5 kV 高压交流负荷开关》 GB 16926 《高压交流负荷开关-熔断器组合电器》 ■ GB 4208 《外壳防护等级》 ■ GB 311.1 《高压输变电设备的绝缘配合》 GB 3309 《高压开关设备常温下的机械试验》 ■ GB 11023 《高压开关设备六氟化硫气体密封实验方法》 GB/T 8905 《六氟化硫电器设备中气体管理和检测导则》 GB 5832.2 《气体中微量水分的测定露点法》 DL/T404 《3.6kV ~ 40.5kV 交流金属封闭开关设备和控制设备》 DL/T 593 《高压开关设备和控制设备标准的共用技术要求》 | <ul style="list-style-type: none"> ■ GB/T 3906 Alternating-current metal-enclosed switchgear and controlgear for rated voltages above 3.6kV and up to and including 40.5kV ■ GB/T11022 Common specifications for high-voltage switchgear and controlgear standards GB 1984 High-voltage alternating-current circuit-breakers ■ GB 1985 High-voltage alternating-current disconnectors and earthing switches GB 3804 High-voltage alternating-current switches for rated voltage above 3.6kV and less than 40.5kV GB 16926 High-voltage alternating current switch-fuse combinations GB 4208 Degrees of protection provided by enclosures (IP code) GB 311.1 Insulation coordination for high voltage transmission and distribution equipment GB 3309 Mechanical test at ambient temperature for high-voltage switchgear GB 11023 Test guide of SF6 gas tightness for high-voltage switchgear GB/T 8905 The guide for processing and measuring SF6 gas in power apparatus GB 5832.2 Determination of moisture in gases-Part2: Dew point method DL/T 404 Alternating-current metal-enclosed switchgear and controlgear for rated voltages above 3.6kV and up to and including 40.5kV DL/T 593 Common specification for high-voltage switchgear and controlgear standards |
|---|--|

技术特点 Technical Advantages

- 一次高压带电部件全部密封在不锈钢板焊接而成的气箱内，整个开关装置不受外部环境影响，保证运行可靠性和人身安全，并实现了免维护；
- 结构紧凑，可以方便安装在空间受限的场所；
- 不锈钢气箱采用 3mm 304 不锈钢材料，由领先的三维五轴激光焊接系统焊接而成，设备全部从德国 TRUMPF 公司进口，气箱整体焊接质量更高，气密性更好，外表美观；
- 采用德国 SEILER 公司全自动氦气检漏设备，保证气箱泄漏率 <0.01%/年，气箱正常工作寿命大于 30 年；
- 模块化设计，根据设计方案排列组合，扩展灵活，完成各种配电需要；
- 扩展母线完全绝缘和屏蔽，确保了高可靠性和安全性；简单而有效的联锁，防止误操作；
- 操作机构可靠，负荷开关机械寿命高达 5000 次，真空断路器机械寿命高达 10000 次；
- 负荷开关-熔断器组合电器单元转移电流达到 12kV,1750A; 24kV 1400A;
- 可以提供工厂化的自动化解决方案，实现智能化开关的概念；
- 全自动装配流水线，保证产品一致性。



- Completely sealed system with a stainless steel tank containing all the live parts and switching functions. A sealed gas tank with constant atmospheric conditions ensures a high level of reliability as well as personnel safety and a virtually maintenance-free system.
- Easy insulation, compact structure, could be easily installed in a limited space.
- The gas tank is made from 3mm #304 stainless steel, by means of TRUMPF three dimension and five-axis laser welding technology, which provides high tensile structure, good sealing qualities and neat appearance.
- The fully automatic and integral helium leak detection system, imported from SEILER Vakuumentchnik GmbH, Germany, brings gas leakage rate per year down to less than 0.01%, guaranteeing a life span of gas tank of more than 30 years.
- Modular design, permutation and combination according to the design scheme, flexible extension, meet a variety of distribution requirements.
- The external busbar is fully insulated and screened to ensure reliability and climatic independence.
- Simple but effective interlocks can prevent mal-operation.
- Reliable and long lifetime operating mechanism, Mechanical life up to 5000 times for Load break Switch, and 10000 times for Vacuum Circuit Breaker.
- The Transmitting current up to 1750A,12kV; 1400A,24kV;
- Can be supplied with remote control and monitoring equipment, implementing intelligent switch request.
- The equipment is manufactured in identical automatic manufacturing line, identical technology procedure and according to the same standards.



先进的生产设备与工艺 Advanced manufacture equipment and technology



TRUMPF 3030 二维激光加工机床
TRUMPF 3030 2D laser machine

德国 TRUMPF 公司的数控激光切割加工中心，重复定位精度 0.02mm，下料精度 0.05mm，确保气箱拼装间隙小于 0.1mm。

The German TRUMPF Corporation's cutting numerical control machining center, repeated pointing accuracy 0.02mm and 0.05mm precision materials, guarantee the assembling gap of gas box to be smaller than 0.1mm.



TRUMPF Laser Cell 6005 三维激光加工机床
TRUMPF Laser Cell 6005 3D laser machine

德国 TRUMPF 公司的数控激光焊接系统具有 $\Phi 0.1\text{mm}$ 的激光束。在氦气的保护中，瞬间熔结不锈钢端面，焊接效果等同于钢板折弯，确保气箱的气密性和一致性。

The German TRUMPF Corporation's numerical control three dimensional five axes laser welding system with the $\Phi 0.1\text{mm}$ laser beam. In the protection of helium, melt the stainless steel end surface instantaneously, the welding effects equivalent to bending, guarantee the tightness and the consistency of gas tank.



SEILER 公司的全自动氦检设备
Automatic helium leak detection equipment

SEILER 公司的全自动氦气检漏设备，通过检测单位时间 He 分子的泄漏量，年泄漏率小于 0.01%，确保气箱有效使用寿命大于 30 年。

The SEILER Corporation's automatic helium leak detection equipment, through the examination of unit time leakage of the He elements, the leakage rate less than 0.01% one year, ensures the gas box effective work-life more than 30 years.

技术参数:12KV Technical Data

参数名称 Parameter	单位 Unit	负荷开关柜 Load-break switch unit(C)	熔断器组合电器柜 Switch-fuse combination unit(F)	断路器柜 VCB unit(V)
额定电压 Rated voltage	kV	12	12	12
额定频率 Rated frequency	Hz	50	50	50
额定电流 Rated current	A	630	125*	630/1250
额定工频耐受电压(1min) Rated power frequency withstand voltage (1min)	kV	42/48	42/48	42/48
额定雷电冲击耐压(峰值) Rated lightning impulse withstand voltage (peak)	kV	75/85	75/85	75/85
电寿命 Making and breaking operation cycles	Times	E3	E3	E2
机械寿命 Mechanical endurance	Times	5000	5000	10000
额定短路开断电流 Rated short circuit breaking current	kA		31.5*	20/25
额定关合电流(峰值) Rated short circuit making current (peak)	kA	50/63	80*	50/63
额定转移电流 Rated transform current	A		1750	
主回路、接地回路额定峰值耐受电流 Rated peak withstand current of primary and earthing circuit	kA	50/63		50/63
接地回路额定短时耐受电流(2s) Rated short-time withstand current (2s) of earthing circuit	kA	20		20
主回路额定短时耐受电流(4s) Rated short-time withstand current (4s) of primary circuit	kA	20(25,4s)		20/25
内部燃弧等级 IAC class	kA/s	AFLR, 20kA, 1s		
额定工作压力(20°C表压) Rated operating pressure (at 20°C, gauge)	MPa	0.03	0.03	0.03
最低工作压力(20°C表压) Minimum operating pressure (at 20°C, gauge)	MPa	0.02	0.02	0.02
额定电缆充电开断电流 Rated cable charging current	A	135		
接地故障电流 Earthing fault breaking current	A	200		
接地故障电缆充电电流 Earthing fault cable charging current	A	115		
外壳防护等级 Enclosure protection degree	IP	IP41	IP41	IP41
气箱防护等级 Gas tank protection degree	IP	IP67	IP67	IP67
气体年泄漏率 Gas leakage rate per year	%/year	≤0.01%	≤0.01%	≤0.01%
开关柜宽度 Switchgear width	mm	360/375	360/420	360/420/425/500
开关柜深度 Switchgear depth	mm	780/750(不含门)		
开关柜高度 Switchgear height	mm	1865/1950		

*受限于高压熔断器 Limited by the high-voltage fuse

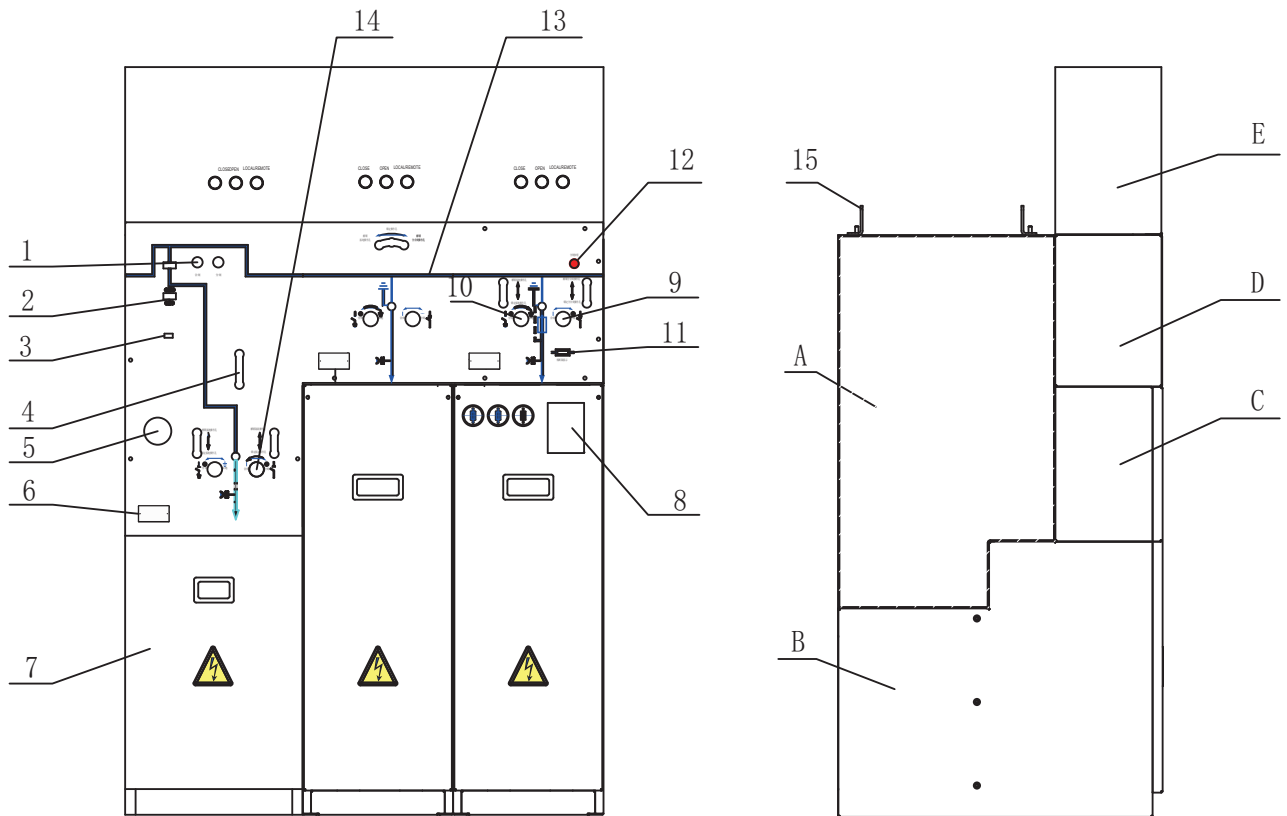
*含国网标准化定制尺寸 Including standardized customized size of state grid

技术参数:24KV Technical Data

参数名称 Parameter	单位 Unit	负荷开关柜 Load-break switch unit(C)	熔断器组合电器柜 Switch-fuse combination unit(F)	断路器柜 VCB unit(V)
额定电压 Rated voltage	kV	24	24	24
额定频率 Rated frequency	Hz	50	50	50
额定电流 Rated current	A	630	125*	630
额定工频耐受电压(1min) Rated power frequency withstand voltage (1min)	kV	65/79	65/79	65/79
额定雷电冲击耐压(峰值) Rated lightning impulse withstand voltage (peak)	kV	125/145	125/145	125/145
电寿命 Making and breaking operation cycles	Times	E3	E3	E2
机械寿命 Mechanical endurance	Times	5000	5000	10000
额定短路开断电流 Rated short circuit breaking current	kA		31.5*	20/25
额定关合电流(峰值) Rated short circuit making current (peak)	kA	50/63	80*	50/63
额定转移电流 Rated transform current	A		1400	
主回路、接地回路额定峰值耐受电流 Rated peak withstand current of primary and earthing circuit	kA	50/63		50/63
接地回路额定短时耐受电流(2s) Rated short-time withstand current (2s) of earthing circuit	kA	20		20
主回路额定短时耐受电流(4s) Rated short-time withstand current (4s) of primary circuit	kA	20(25,3s)		20(25,3s)
内部燃弧等级 IAC class	kA/s	AFLR, 20kA, 1s		
额定工作压力(20°C表压) Rated operating pressure (at 20°C, gauge)	MPa	0.03	0.03	0.03
最低工作压力(20°C表压) Minimum operating pressure (at 20°C, gauge)	MPa	0.02	0.02	0.02
额定电缆充电开断电流 Rated cable charging current	A	135		
接地故障电流 Earthing fault breaking current	A	150		
接地故障电缆充电电流 Earthing fault cable charging current	A	87		
外壳防护等级 Enclosure protection degree	IP	IP4X	IP4X	IP4X
气箱防护等级 Gas tank protection degree	IP	IP67	IP67	IP67
气体年泄漏率 Gas leakage rate per year	%/year	≤0.01%	≤0.01%	≤0.01%
开关柜宽度 Switchgear width	mm	360	360	425/500

*受限于高压熔断器 Limited by the high-voltage fuse

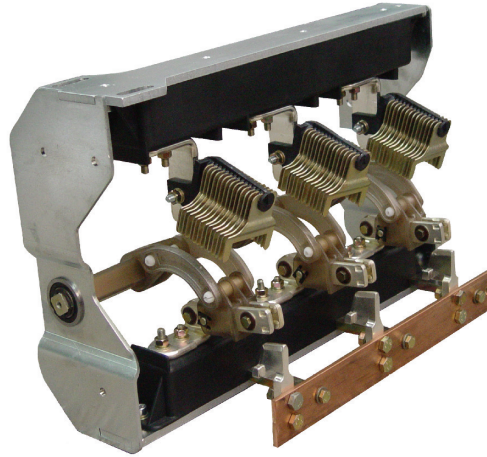
结构示意图 Structure Sketch



- | | | |
|--|--|---|
| 1. 真空断路器分合闸按钮
VCB Push buttons close/open operation | 8. 铭牌
Nameplate | 15. 吊环
Lifting lug |
| 2. 断路器储能指示
Charged spring indicator | 9. 负荷开关操作孔
Load break switch operating hole | A. 充气箱体
Gas tank |
| 3. 计数器
Counter | 10. 接地开关操作孔
Earthing switch operating hole | B. 电缆室
Cable Compartment |
| 4. 手动储能孔
Manual spring charging hole | 11. 熔断器指示
Fuse blown indicator | C. 熔断器室
Fuse Compartment |
| 5. 气压表
SF6 Manometer | 12. 分闸按钮
Opening button | D. 操作机构室
Operating mechanism Compartment |
| 6. 带电显示器
Voltage indicator | 13. 模拟系统图
Mimic diagram | E. 低压室
Low voltage Compartment |
| 7. 电缆室门
Cable compartment door | 14. 三工位隔离开关操作孔
3-Position disconnector operating hole | |

主要元件 Main Components

负荷开关 Load break switch



负荷开关有以下3种状态:

- 合闸
- 分闸
- 接地

The loadbreak switch with three positions:

- Closing
- Opening
- Earthing

真空断路器 Vacuum circuit breaker



真空断路器特点:

- 断路器三相极柱采用垂直布置结构,按照深度方向安装于气室内,减少了开关柜的宽度
- 操作机构安装在气室外,便于检修
- 变直机构与绝缘拉杆通过直动波纹管相连,传递动力
- 与三工位开关配合进行接地操作,安全可靠
- 与三工位开关具有完备的机械联锁装置
- 免维修

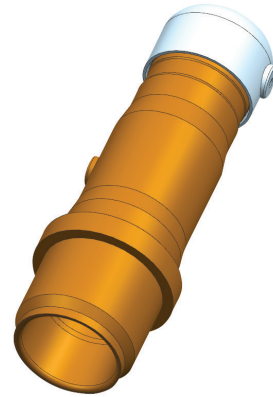
Vacuum circuit-breaker characteristics:

- Vertical arrangement of circuit breaker poles are installed in the gas compartment according to depth direction decreasing by switchgear width
- Operating mechanism is installed outside the gas compartment, mainly.
- Straight driving mechanism and insulating rods are connected by straight moving bellows transmitting force
- Earthing function in combination with the three position switch, it is reliable
- Mechanical interlock between the VCB and three position switch.
- Maintenance-free

熔丝筒 Fuse canisters

- 界面绝缘，熔断器更换方便
- 特殊结构，防护等级 IP67

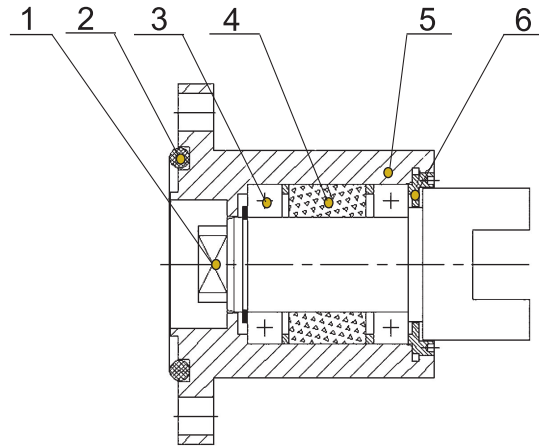
- Interface insulated, easily change fuse
- Special structure and protection level IP67



特殊设计的动密封结构 Specially designed dynamic seal structure

- 气密性好
- 可靠性高寿命长
- 耐压性能好

- Good air tightness
- High reliability and long life
- Excellent withstand pressure



- 1. 主轴
Main shaft
- 2. 密封圈
Sealing loop

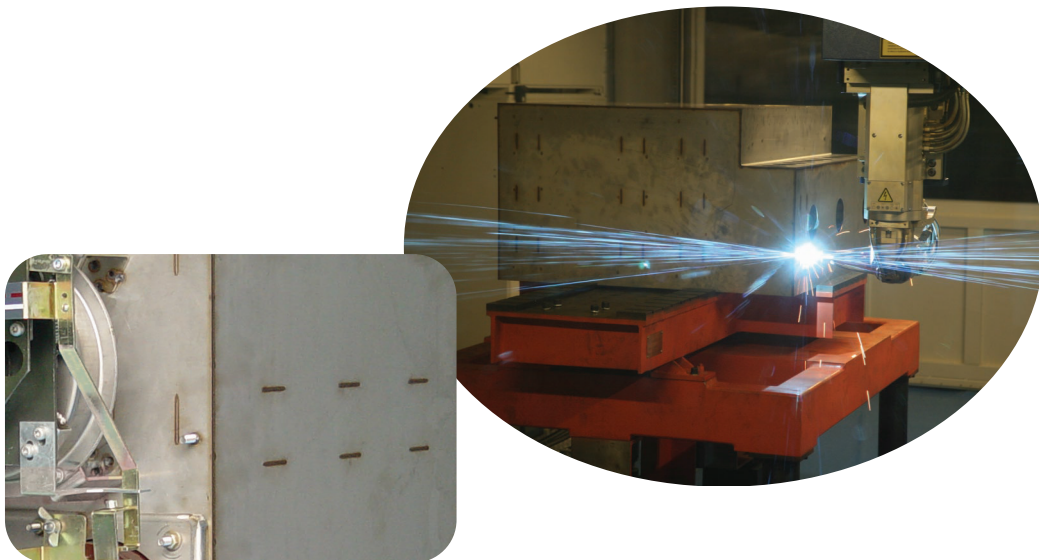
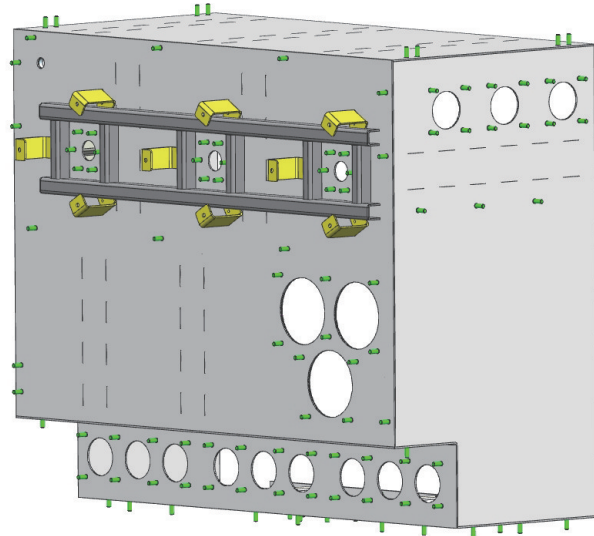
- 3. 轴承
Bearing
- 4. 磁流体
Magnetic fluid

- 5. 法兰盘
Flange tray
- 6. 轴承盖
Lid of bearing

充气单元 Gas tank

- 全封闭不锈钢箱体
- 激光焊接、氦气检查
- 免维护
- 防护等级IP67
- 结构紧凑，占地面积小

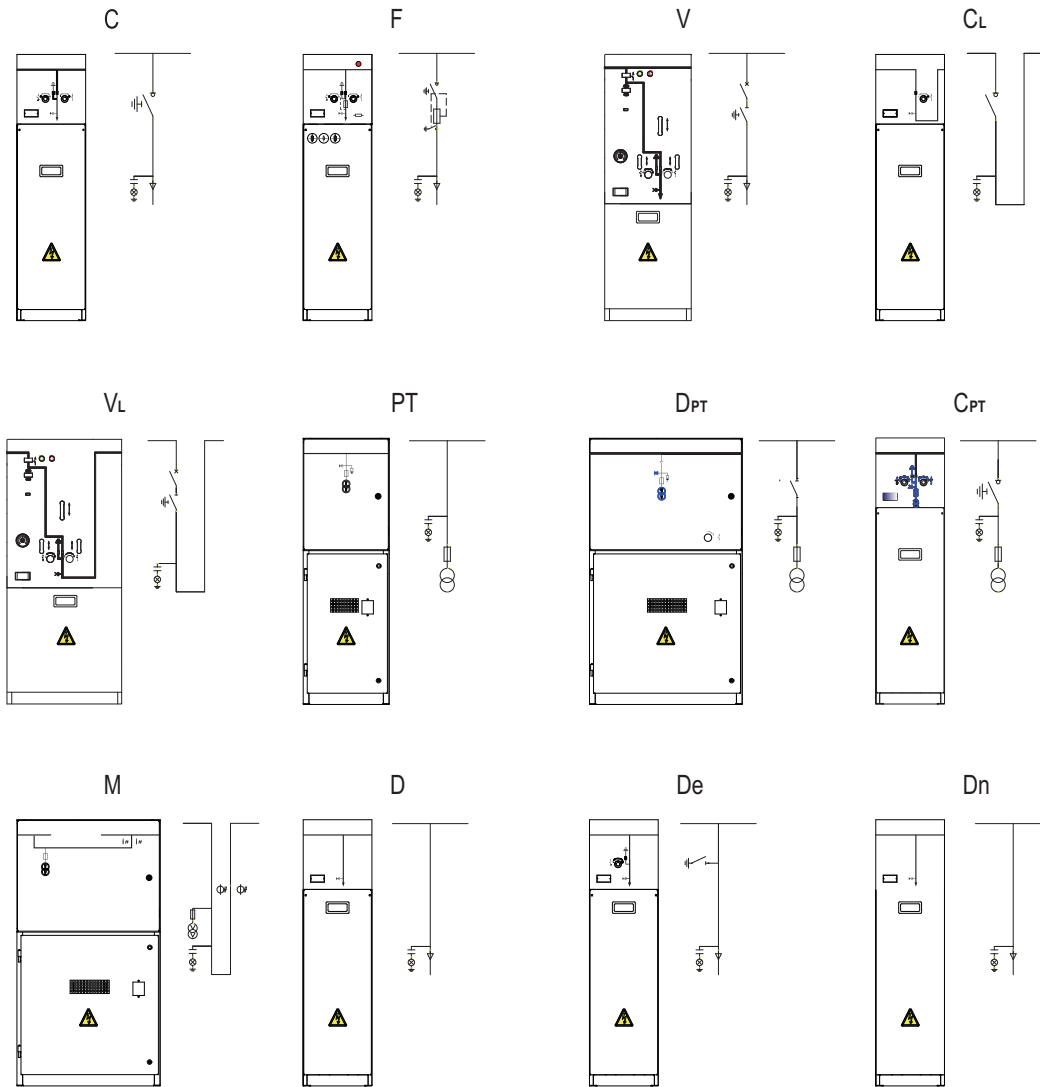
- Full sealed stainless steel enclosure
- Laser welding and Helium leak detection
- Maintenance-free
- Protection level IP67
- Structure compact, minimum space required



产品方案 Product Description

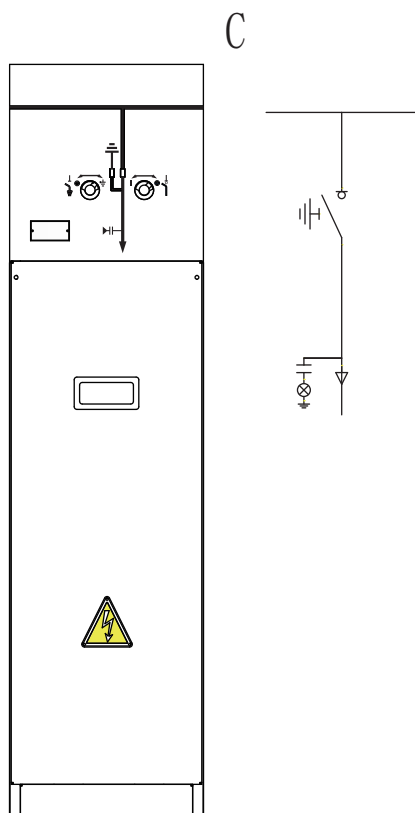
方案满足国网标准化定制要求

DQS 系列气体绝缘环网柜基本柜型 DQS series RMU basic Modules



- | | |
|--------------------|--|
| ■ C 负荷开关单元 | ■ C-Cable load break switch unit |
| ■ F 负荷开关熔断器组合电器单元 | ■ F-Switch-Fuse combination unit |
| ■ V 真空断路器单元 | ■ V-Vacuum circuit breaker unit |
| ■ CL 母线分段负荷开关单元 | ■ CL-Busbar sectionaliser load break switch unit |
| ■ VL 母线分段断路器单元 | ■ VL-Busbar sectionaliser VCB unit |
| ■ PT 不带开关电压互感器单元 | ■ PT-Voltage transformer with DS unit |
| ■ DPT 带隔离开关电压互感器单元 | ■ DPT-Voltage transformer with DS unit |
| ■ CPT 带负荷开关电压互感器单元 | ■ CPT-Voltage transformer with LBS unit |
| ■ M 计量柜单元 | ■ M-Metering panel unit |
| ■ D 直接进线单元 | ■ D-Direct cable in unit |
| ■ De 带接地开关直接进线单元 | ■ De-Direct cable in with ES unit |
| ■ Dn 侧面直接进线单元 | ■ Dn-Direct cable in from side unit |

负荷开关单元DQS-C Load break switch Unit DQS-C



标准配置:

- 全封闭不锈钢箱体
- 激光焊接、氦气检查
- 免维护
- 防护等级IP67
- 630A母线
- 三工位负荷开关/接地开关
- 三工位开关单簧操作机构
- 负荷开关和接地开关位置指示
- 开关功能挂锁滑板
- 位于前部水平布置的630A带传感器功能的出线套管
- 指示套管带电的容性带电显示器
- SF6气体压力表（共箱时每个气箱配一只气体压力表）
- 接地母线
- 接地开关与电缆室前下门的联锁

可选配置:

- 两工位负荷开关
- 预留外部母线扩展
- 预留侧面连接扩展
- 负荷开关电动操作 DC24/48/110/220V,AC110V/220V
- 短路及接地故障指示器
- 环形电流互感器及电流表
- 可触摸式电缆头
- 电缆套管处加装后接式避雷器或双电缆头
- 钥匙互锁
- 进线带电接地闭锁装置 DC24/48/110/220V,AC110V/220V
- 辅助触点
 - 负荷开关位置 2NO+2NC
 - 接地开关位置 2NO+2NC
 - 带信号的压力表 2NO
- 二次装置可装设于开关柜顶部的低压室

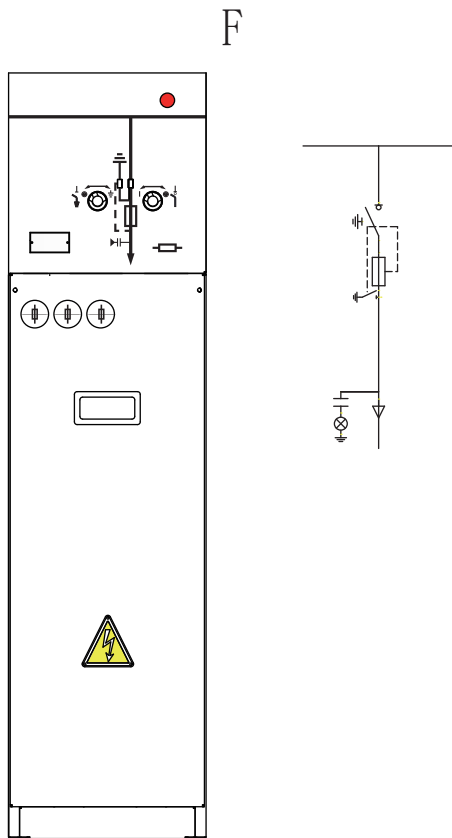
Standard configuration and characteristic:

- Busbar 630A
- Three position load break switch with disconnect and earthing switch
- Single-spring operating mechanism with three positions
- LBS and ES position indicator
- Padlocks on faceplates for every switch
- 630A Cable bushings horizontal in front, with integrated capacitor for voltage indication
- Capacitive voltage indicating systems
- SF6 gauge (only one each SF6 tank)
- Earthing busbar
- Interlock between ES and cable compartment door

Optional features:

- Two position load break switch
- Bushings for connection of external busbar on top
- Bushings for side extension
- Electrical mechanism for LBS DC24/48/110/220V,AC110V/220V
- Short circuit and earth fault indicator
- Loop current transformer for metering and current meter
- Touchable cable termination kits
- Lightning arrester or double cable connection
- Key interlock
- Interlock of incoming earthing switch DC24/48/110/220V, AC110V/220V
- Auxiliary contacts
 - Position of LBS 2NO+2NC
 - Position of ES 2NO+2NC
 - Signal from pressure indicator 2NO
- Low voltage compartment

负荷开关-熔断器组合电器单元 DQS-F



Standard configuration and characteristic:

- Busbar 630A
- Three position switch-fuse combination with upstream earthing switch mechanically linked with downstream earthing switch
- Double-spring operating mechanism with three positions
- LBS and ES position indicator
- Integrated fuse canisters
- Fuse status indicator
- Padlocks on faceplates for every switch
- 630A Cable bushings horizontal in front, with integrated capacitor for voltage indication
- Capacitive voltage indicating systems
- SF6 gauge (only one each SF6 tank)
- Earthing busbar
- Interlock between ES and cable compartment door

标准配置:

- 630A 母线
- 三工位负荷/接地开关-熔断器组合电器及熔断器两端机械联动接地开关
- 三工位开关双簧操作机构
- 负荷开关和接地开关位置指示
- 熔断器筒
- 熔断器状态指示
- 开关功能挂锁滑板
- 位于前部水平布置的 630A 带传感器功能的出线套管
- 指示套管带电的容性带电显示器
- SF6 气体压力表 (共箱时每个气箱配一只气体压力表)
- 接地母线
- 接地开关与电缆室前下门的联锁

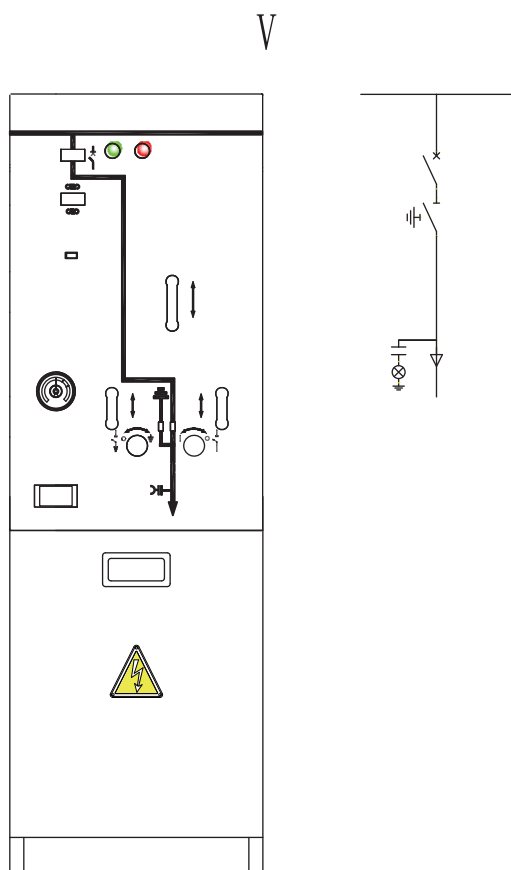
可选配置:

- 预留外部母线扩展
- 预留侧面连接扩展
- 用于变压器保护的高压熔断器 (详见熔断器选型表)
- 负荷开关电动操作 DC24/48/110/220V, AC110V/220V
- 分励脱扣器 DC24/48/110/220V, AC110V/220V
- 短路及接地故障指示器
- 环形电流互感器及电流表
- 可触摸式电缆头
- 电缆套管处加装后接式避雷器
- 钥匙互锁
- 辅助触点
 - 负荷开关位置 2NO+2NC
 - 接地开关位置 2NO+2NC
 - 带信号的压力表 2NO
 - 熔断器熔断 1NO
- 二次装置可装设于开关柜顶部的低压室

Optional features:

- Bushings for connection of external busbar on top
- Bushings for side extension
- Fuse used for transformer protection (specification listed below)
- Electrical mechanism for LBS DC24/48/110/220V, AC110V/220V
- Shunt release coil DC24/48/110/220V, AC110V/220V
- Short circuit and earth fault indicator
- Loop current transformer for metering and current meter
- Touchable cable termination kits
- Lightning arrester
- Key interlock
- Interlock of incoming earthing switch
- Auxiliary contacts
 - Position of LBS 2NO+2NC
 - Position of ES 2NO+2NC
 - Signal from pressure indicator 2NO
 - Fuse blown 1NO
- Low voltage compartment

真空断路器单元DQS-V Vacuum circuit breaker Unit DQS-V



标准配置:

- 630A 母线
- 真空断路器
- 真空断路器弹簧操作机构
- 三工位隔离开关
- 三工位隔离开关操作机构
- 真空断路器和三工位开关位置指示
- 真空断路器和三工位开关的机械联锁装置
- 位于前部水平布置的630A带传感器功能的出线套管
- 指示套管带电的容性带电显示器
- SF6 气体压力表 (共箱时每个气箱配一只气体压力表)
- 接地母线
- 接地开关与电缆室前下门的联锁

可选配置:

- 自供电保护装置
- 综合继电保护装置
- 两工位隔离开关
- 预留外部母线扩展
- 预留侧面连接扩展
- 真空断路器电动操作 DC24/48/110/220V,AC110V/220V
- 合闸线圈 DC24/48/110/220V,AC110V/220V
- 分闸线圈 DC24/48/110/220V,AC110V/220V
- 短路及接地故障指示器
- 环形电流互感器及电流表
- 可触摸式电缆头
- 电缆套管处加装后接式避雷器或双电缆头
- 钥匙互锁
- 进线带电接地闭锁装置 DC24/48/110/220V,AC110V/220V
- 辅助触点
- 真空断路器状态 8NO+8NC
- 隔离开关位置 2NO+2NC
- 接地开关位置 2NO+2NC
- 带信号的压力表 2NO
- 二次装置可装设于开关柜顶部的低压室

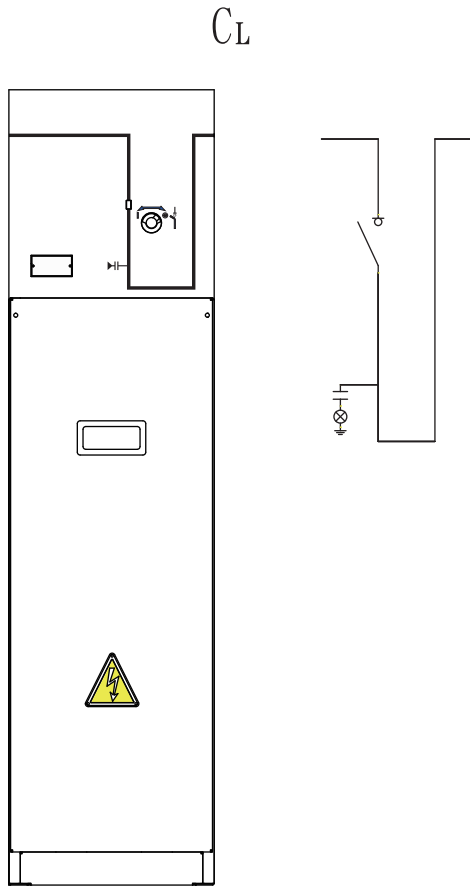
Standard configuration and characteristic:

- Busbar 630A
- Three position load break switch with disconnect and earthing switch
- Single-spring operating mechanism with three positions
- LBS and ES position indicator
- Padlocks on faceplates for every switch
- 630A Cable bushings horizontal in front, with integrated capacitor for voltage indication
- Capacitive voltage indicating systems
- SF6 gauge (only one each SF6 tank)
- Earthing busbar
- Interlock between ES and cable compartment door

Optional features:

- Two position load break switch
- Bushings for connection of external busbar on top
- Bushings for side extension
- Electrical mechanism for LBS DC24/48/110/220V,AC110V/220V
- Short circuit and earth fault indicator
- Loop current transformer for metering and current meter
- Touchable cable termination kits
- Lightning arrester or double cable connection
- Key interlock
- Interlock of incoming earthing switch DC24/48/110/220V, AC110V/220V
- Auxiliary contacts
- Position of LBS 2NO+2NC
- Position of ES 2NO+2NC
- Signal from pressure indicator 2NO
- Low voltage compartment

母线分段负荷开关单元 DQS-CI Busbar Sectionalizer Load break switch Unit DQS-CI



标准配置:

- 630A 母线
- 二工位负荷开关
- 二工位开关单簧操作机构
- 负荷开关位置指示
- 开关功能挂锁滑板
- SF6 气体压力表 (共箱时每个气箱配一只气体压力表)
- 接地母线

可选配置:

- 预留外部母线扩展
- 预留侧面连接扩展
- 指示套管带电的容性带电显示器
- 负荷开关电动操作 DC24/48/110/220V, AC110V/220V
- 环形电流互感器 (安装在外部母线上) 及电流表
- 钥匙互锁
- 辅助触点
- 负荷开关位置 2NO+2NC
- 带信号的压力表 2NO
- 二次装置可装设于开关柜顶部的低压室

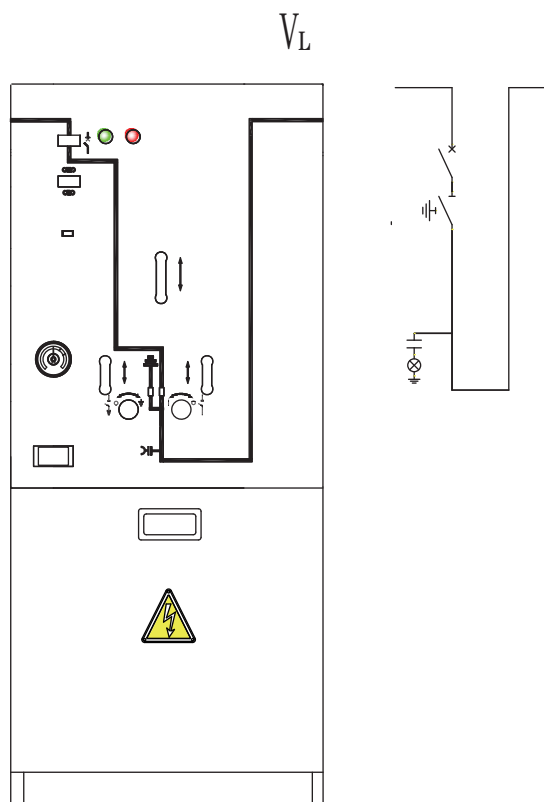
Standard configuration and characteristic:

- Busbar 630A
- Two position load break switch
- Single-spring operating mechanism with two positions
- LBS position indicator
- Padlocks on faceplates for every switch
- SF6 gauge (only one each SF6 tank)
- Earthing busbar

Optional features:

- Bushings for connection of externa busbar on top
- Bushings for side extension
- Capacitive voltage indicating systems
- Electrical mechanism for LBS DC24/48/110/220V, AC110V/220V
- Loop current transformer for metering (on external busbar only) and current meter
- Key interlock
- Auxiliary contacts
- Position of LBS 2NO+2NC
- Signal from pressure indicator 2NO
- Low voltage compartment

母线分段真空断路器单元 DQS-VI Busbar Sectionalizer VCB Unit DQS-VI



标准配置:

- 630A 母线
- 真空断路器
- 真空断路器弹簧操作机构
- 三工位隔离开关
- 三工位隔离开关操作机构
- 真空断路器和三工位开关位置指示
- 真空断路器和三工位开关的机械联锁装置
- 指示套管带电的容性带电显示器
- SF6 气体压力表 (共箱时每个气箱配一只气体压力表)
- 接地母线
- 接地开关与前下门的联锁

可选配置:

- 自供电保护装置
- 综合继电保护装置
- 两工位隔离开关
- 预留外部母线扩展
- 预留侧面连接扩展
- 真空断路器电动操作 DC24/48/110/220V, AC110V/220V
- 合闸线圈 DC24/48/110/220V, AC110V/220V
- 分闸线圈 DC24/48/110/220V, AC110V/220V
- 环形电流互感器及电流表
- 钥匙互锁
- 辅助触点
- 真空断路器状态 8NO+8NC
- 隔离开关位置 2NO+2NC
- 接地开关位置 2NO+2NC
- 带信号的压力表 2NO
- 二次装置可装设于开关柜顶部的低压室

Standard configuration and characteristic:

- Busbar 630A
- Vacuum circuit breaker
- Spring mechanism for vacuum circuit-breaker
- Three position disconnect/earthing switch
- Operating mechanism of three position disconnect
- VCB and DS, ES position indicator
- Mechanical interlock between VCB and DS
- 630A Cable bushings horizontal in front, with integrated capacitor for voltage indication
- Capacitive voltage indicating systems
- SF6 gauge (only one each SF6 tank)
- Earthing busbar
- Interlock between ES and lower front door

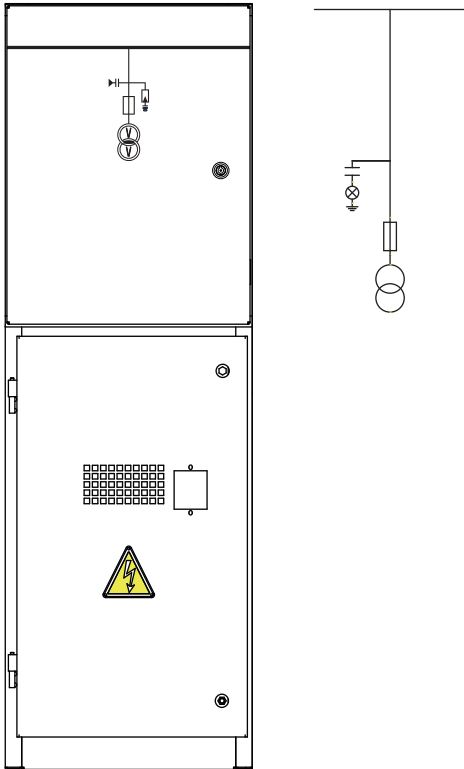
Optional features:

- Self powered electronic protection relay
- Integrated protection relay
- Two position disconnect
- Bushings for connection of external busbar on top
- Bushings for side extension
- Electrical mechanism for VCB DC24/48/110/220V, AC110V/220V
- Closing shunt release DC24/48/110/220V, AC110V/220V
- Tripping shunt release DC24/48/110/220V, AC110V/220V
- Loop current transformer for metering and current meter
- Key interlock
- Interlock of incoming earthing switch DC24/48/110/220V, AC110V/220V
- Auxiliary contacts
- Position of VCB 8NO+8NC
- Position of DS 2NO+2NC
- Position of ES 2NO+2NC
- Signal from pressure indicator 2NO
- Low voltage compartment

电压互感器单元 DQS-PT Voltage transformer Unit DQS-PT

本柜为空气绝缘单元 This is air insulated unit

PT



标准配置:

- 母线 630A
- 电压互感器 JDZ-10, 2只及电压表
- 保护电压互感器的高压熔断器
- 35mm² 连接电缆及电缆接头
- 指示套管带电的容性带电显示器, 具备带电闭锁功能
- 电磁锁
- 接地母线

可选配置:

- 电压互感器, 1只
- 电压互感器, 3只
- 供电变压器 3kVA DC-3, 2只或1只
- 以上方案及标准方案的电压互感器配置只能选择其中1种
- 顶部母线扩展套管
- 避雷器
- 24V DC 充电模块及电池 2只 12V,24Ah
- 二次装置可装设于开关柜顶部的低压室

Standard configuration and characteristic:

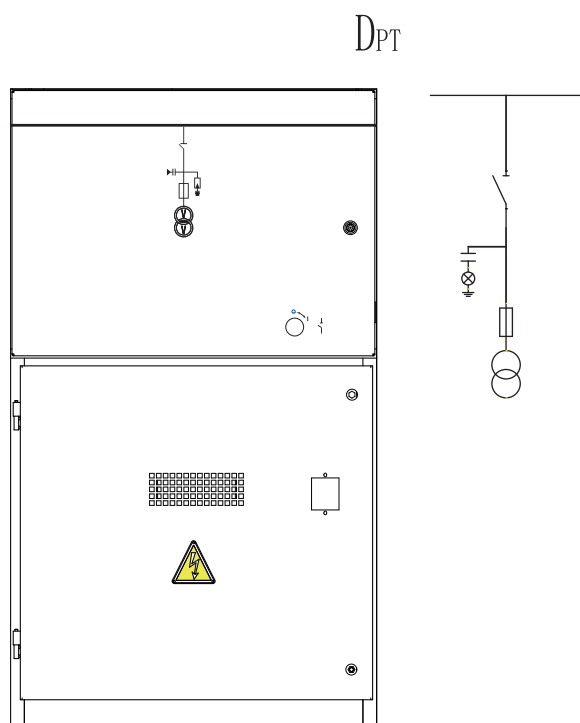
- Busbar 630A
- Two type JDZ-10 voltage transformer, "VV" connection, and voltage meter
- Fuse for protection of PT
- 35mm² connection cable and cable connector
- Capacitive voltage indicating systems
- Electromagnetic lock
- Earthing busbar

Optional features:

- Voltage transformer 1 ps, "--" connection
- Voltage transformer 3ps, "YY" connection
- 3kV operating transformer DC-3 1ps or 2ps.
- Bushings for connection of external busbar on top
- Lightning arrester
- 24VDC charge module and two rechargeable batteries,12V,24Ah
- Low voltage compartment

带隔离开关电压互感器单元DQS-DPT(仅12kV) Voltage transformer with disconnector switch Unit DQS-dPT(12kV only)

本柜为空气绝缘单元 This is air insulated unit



标准配置:

- 母线 630A
- 电压互感器 JDZ-10, 2只及电压表
- 保护电压互感器的高压熔断器
- 隔离开关
- 隔离开关操作机构
- 隔离开关位置指示
- 连接电缆及电缆接头
- 指示套管带电的容性带电显示器, 具备带电闭锁功能
- 电磁锁

可选配置:

- 电压互感器, 1只
- 电压互感器, 3只
- 供电变压器 3kVA DC-3, 2只或1只
- 以上方案及标准方案的电压互感器配置只能选择其中1种
- 顶部母线扩展套管
- 避雷器
- 24V DC 充电模块及电池 2只 12V,24Ah
- 二次装置可装设于开关柜顶部的低压室

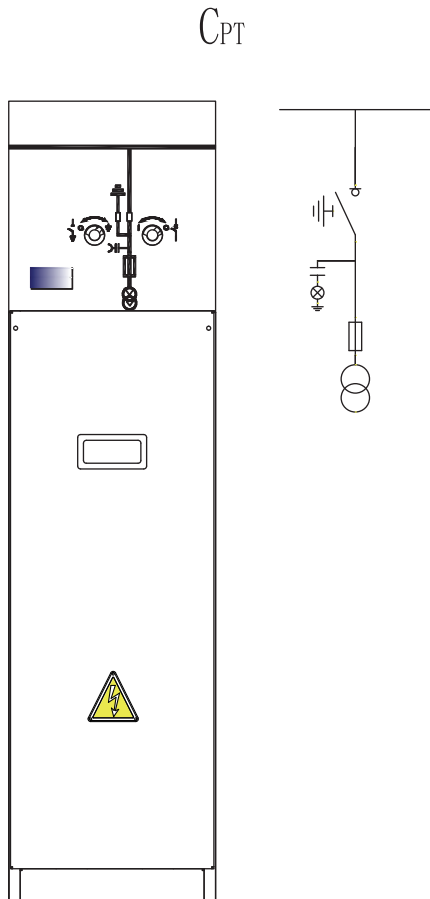
Standard configuration and characteristic:

- Busbar 630A
- Two type JDZ-10 voltage transformer, "VV" connection, and voltage meter
- Fuse for protection of PT
- Disconnector
- Mechanism of disconnector
- DS position indicator
- Connection Cable and cable connector
- Capacitive voltage indicating systems
- Electromagnetic lock
- Earthing busbar

Optional features:

- Voltage transformer 1 ps, "--" connection
- Voltage transformer 3ps, "YY" connection
- 3kV operating transformer DC-3 1ps or 2ps.
- Bushings for connection of external busbar on top
- Lightning arrester
- 24VDC charge module and two rechargeable batteries,12V,24Ah
- Low voltage compartment

带负荷开关电压互感器单元 DQS-CPT Voltage transformer with load break switch Unit DQS-CPT



标准配置:

- 母线 630A
- 电压互感器 JSZV16-10R, 1 只及电压表
- 三工位负荷开关/接地开关
- 三工位开关单簧操作机构
- 负荷开关和接地开关位置指示
- 开关功能挂锁滑板
- 位于前部水平布置的 630A 带传感器功能的出线套管
- PT 连接电缆及电缆接头
- 指示套管带电的容性带电显示器, 具备带电闭锁功能
- 接地母线
- 接地开关与电缆室前下门的联锁

可选配置:

- 电压互感器 JSZV-10R, 1 只
- 以上方案及标准方案的电压互感器配置只能选择其中 1 种
- 两工位负荷开关
- 预留外部母线扩展
- 预留侧面连接扩展
- 负荷开关电动操作 DC24/48/110/220V, AC110V/220V
- 避雷器
- 辅助触点
- 负荷开关位置 2NO+2NC
- 接地开关位置 2NO+2NC
- 带信号的压力表 1NO
- 二次装置可装设于开关柜顶部的低压室

Standard configuration and characteristic:

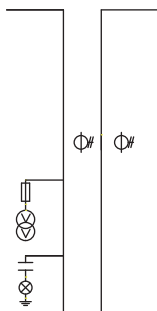
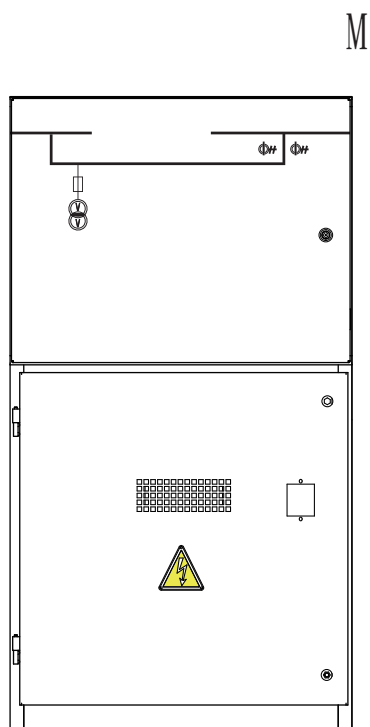
- Busbar 630A
- Two type JSZV16-10R voltage transformer 1ps, "VV" connection, and voltage meter
- Fuse for protection of PT
- Single-spring operating mechanism with three positions
- LBS and ES position indicator
- Padlocks on faceplates for every switch
- 630A Cable bushings horizontal in front, with integrated capacitor for voltage indication
- Connection Cable and cable connector
- Capacitive voltage indicating systems
- SF6 guage (only one each SF6 tank)
- Earthing busbar
- Interlock between ES and cable compartment door

Optional features:

- Voltage transformer JSZV-10R 1 ps, "--" connection
- Two position load break switch
- Bushings for connection of external busbar on top
- Bushings for side extension
- Electrical mechanism for LBS DC24/48/110/220V, AC110V/220V
- Lightning arrester
- Auxiliary contacts
- Position of LBS 2NO+2NC
- Position of ES 2NO+2NC
- Signal from pressure indicator 1NO
- Low voltage compartment

计量单元DQS-M Metering Unit DQS-M

本柜为空气绝缘单元 This is air insulated unit



标准配置:

- 母线 630A
- 电流互感器 LZZBJ9-10 2只
- 电压互感器 JDZ-10, 2只
- 保护电压互感器的高压熔断器
- 顶部母线扩展套管
- 指示套管带电的容性带电显示器, 具备带电闭锁功能
- 电磁锁
- 接地母线
- 电度表挂架

可选配置:

- 电流互感器, 3只
- 电压互感器, 3只
- 避雷器
- 二次装置可装设于开关柜顶部的低压室
- 计量电表

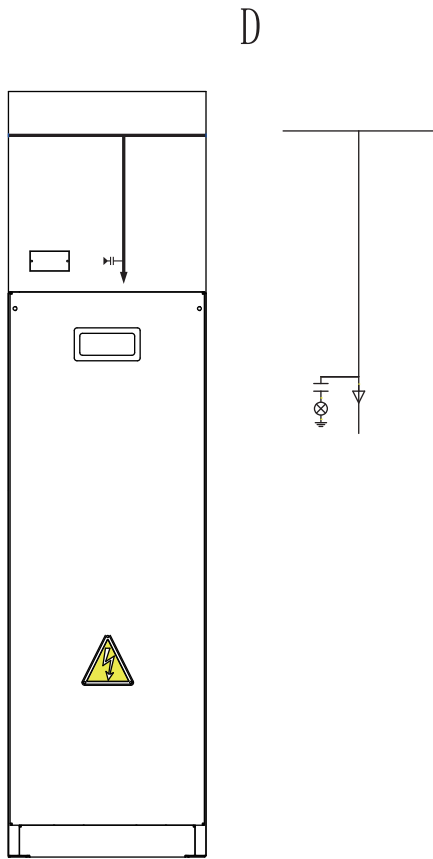
Standard configuration and characteristic:

- Busbar 630A
- Two type LZZBJ9-10 current transformer.
- Two type JDZ-10 voltage transformer, "VV" connection
- Fuse for protection of PT
- Bushings for busbar connection on top
- Capacitive voltage indicating systems
- Electromagnetic lock
- Earthing busbar
- Electricity meter shelve

Optional features:

- Current transformer 3ps
- Voltage transformer 3ps
- Lightning arrester
- Low voltage compartment
- Electricity meter

电缆直接进线单元 DQS-D Direct Cable In Unit DQS-D



标准配置:

- 630A 母线
- 位于前部水平布置的 630A 带传感器功能的出线套管
- 指示套管带电的容性带电显示器
- SF6 气体压力表 (共箱时每个气箱配一只气体压力表)
- 接地母线

可选配置:

- 预留外部母线扩展
- 预留侧面连接扩展
- 短路及接地故障指示器
- 环形电流互感器及电流表
- 可触摸式电缆头
- 电缆套管处加装后接式避雷器或双电缆头
- 二次装置可装设于开关柜顶部的低压室

Standard configuration and characteristic:

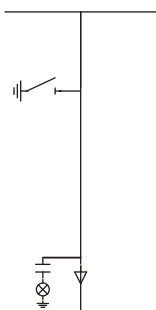
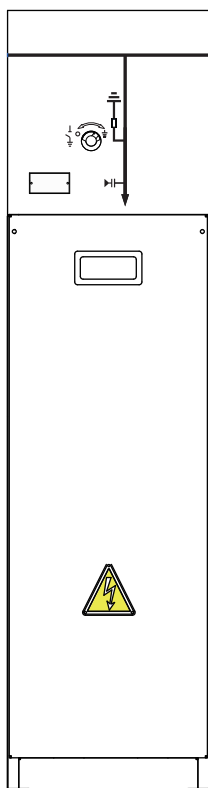
- Busbar 630A
- 630A Cable bushings horizontal in front, with integrated capacitor for voltage indication
- Capacitive voltage indicating systems
- SF6 gauge (only one each SF6 tank)
- Earthing busbar

Optional features:

- Bushings for connection of external busbar on top
- Bushings for side extension
- Short circuit and earth fault indicator
- Loop current transformer for metering and current meter
- Touchable cable termination kits
- Lightning arrester or double cable connection
- Low voltage compartment

带接地开关电缆直接进线单元DQS-De Direct cable in with ES unit Unit DQS-De

De



标准配置:

- 630A 母线
- 接地开关
- 接地开关操作机构
- 接地开关位置指示
- 位于前部水平布置的 630A 带传感器功能的出线套管
- 指示套管带电的容性带电显示器
- SF6 气体压力表 (共箱时每个气箱配一只气体压力表)
- 接地母线

可选配置:

- 预留外部母线扩展
- 预留侧面连接扩展
- 短路及接地故障指示器
- 环形电流互感器及电流表
- 可触摸式电缆头
- 电缆套管处加装后接式避雷器或双电缆头
- 辅助触点
- 接地开关位置 2NO+2NC
- 二次装置可装设于开关柜顶部的低压室

Standard configuration and characteristic:

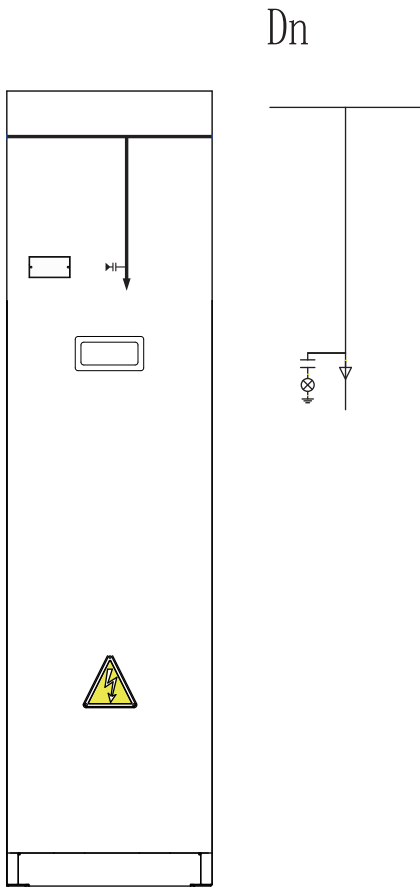
- Busbar 630A
- Earthing switch
- Operating mechanism of earthing switch
- ES position indicator
- Padlocks on faceplates for every switch
- 630A Cable bushings horizontal in front, with integrated capacitor for voltage indication
- Capacitive voltage indicating systems
- SF6 guage (only one each SF6 tank)
- Earthing busbar

Optional features:

- Bushings for connection of external busbar on top
- Bushings for side extension
- Short circuit and earth fault indicator
- Loop current transformer for metering and current meter
- Touchable cable termination kits
- Lightning arrester or double cable connection
- Auxiliary contacts
- Position of ES 2NO+2NC
- Low voltage compartment

计量单元 DQS-M Metering Unit DQS-M

本柜为空气绝缘单元 This is air insulated unit



标准配置:

- 母线 630A
- 电流互感器 LZBJ9-10 2只
- 电压互感器 JDZ-10, 2只
- 保护电压互感器的高压熔断器
- 顶部母线扩展套管
- 指示套管带电的容性带电显示器, 具备带电闭锁功能
- 电磁锁
- 接地母线
- 电度表挂架

可选配置:

- 电流互感器, 3只
- 电压互感器, 3只
- 避雷器
- 二次装置可装设于开关柜顶部的低压室
- 计量电表

Standard configuration and characteristic:

- Busbar 630A
- Two type LZBJ9-10 current transformer.
- Two type JDZ-10 voltage transformer, "VV" connection
- Fuse for protection of PT
- Bushings for busbar connection on top
- Capacitive voltage indicating systems
- Electromagnetic lock
- Earthing busbar
- Electricity meter shelve

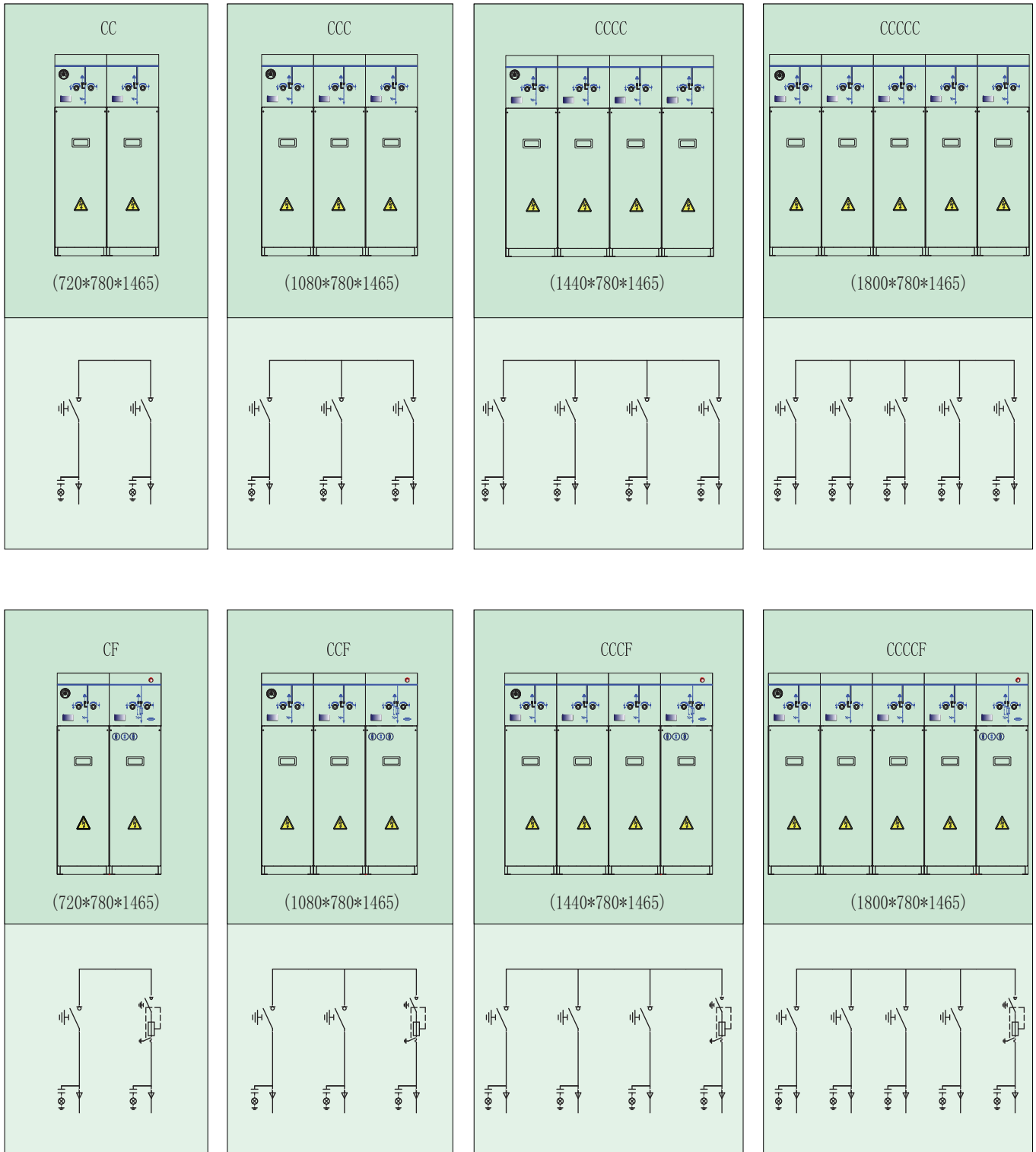
Optional features:

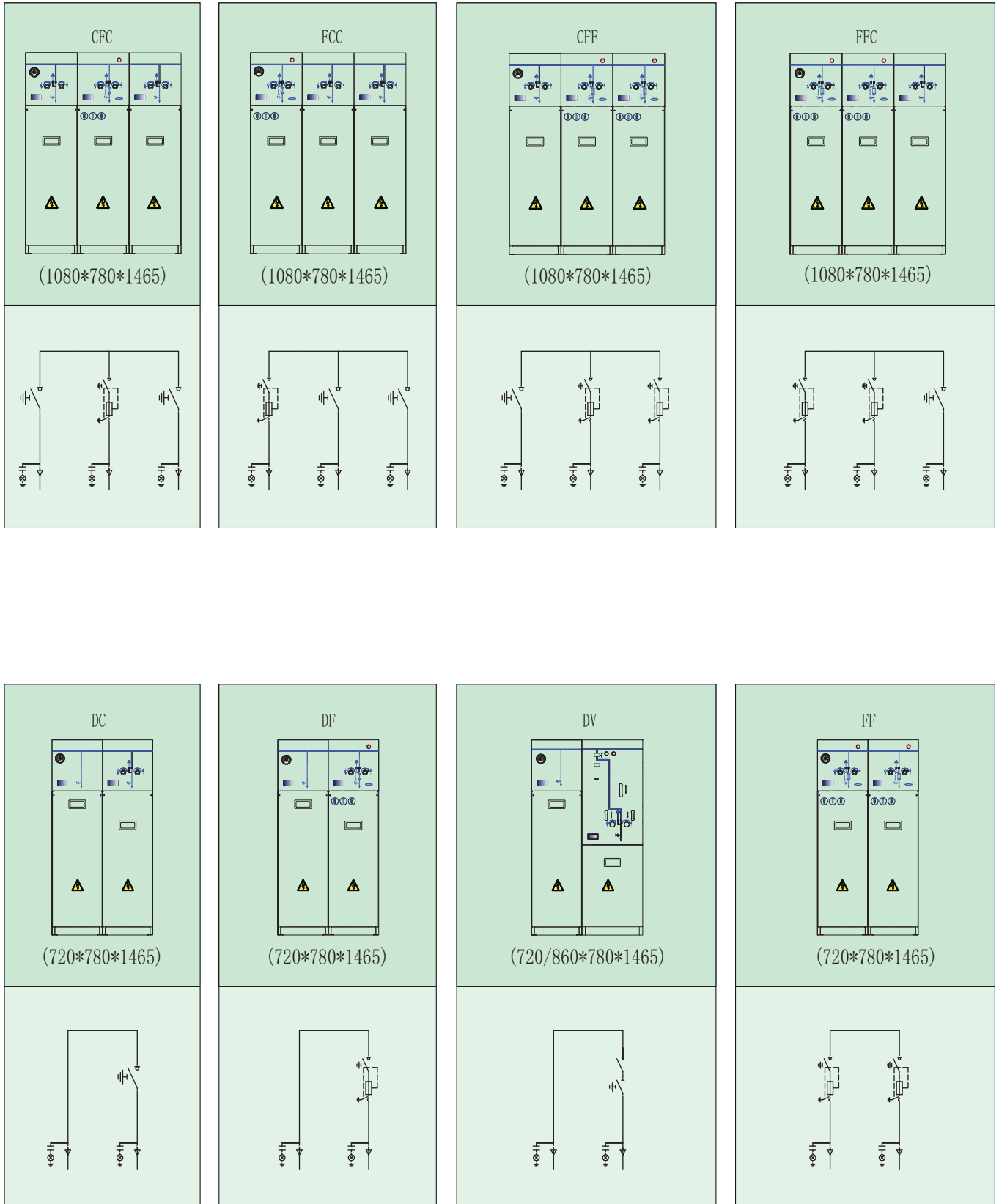
- Current transformer 3ps
- Voltage transformer 3ps
- Lightning arrester
- Low voltage compartment
- Electricity meter

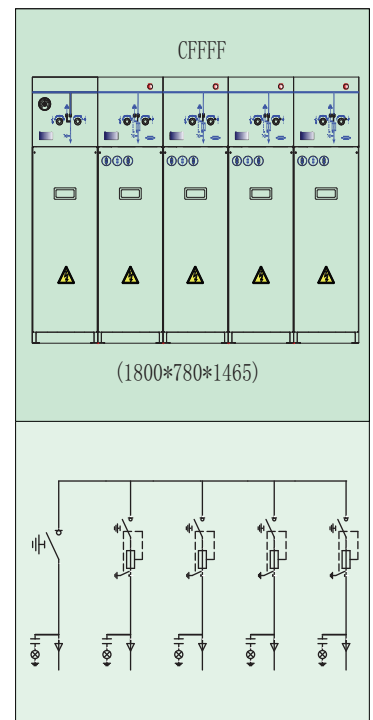
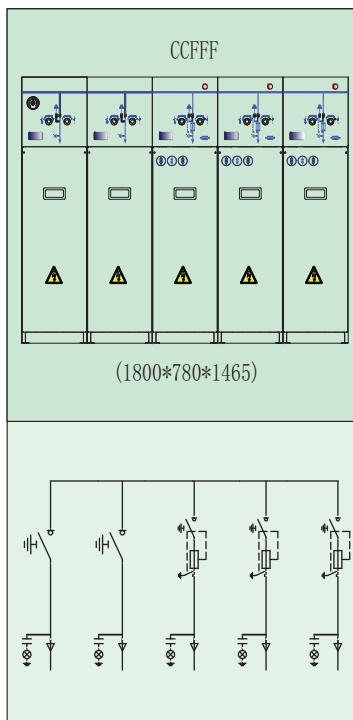
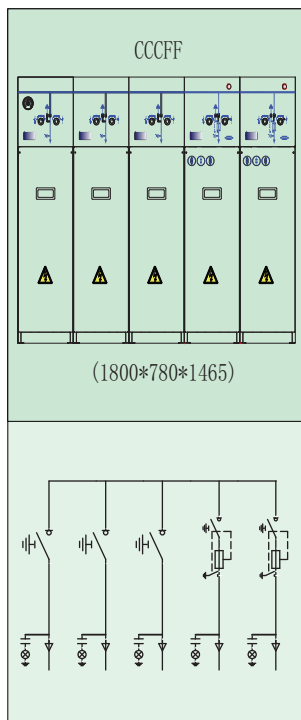
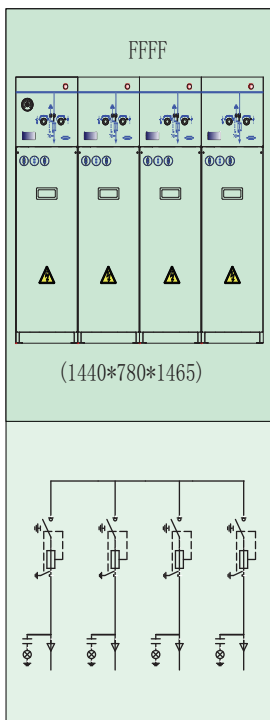
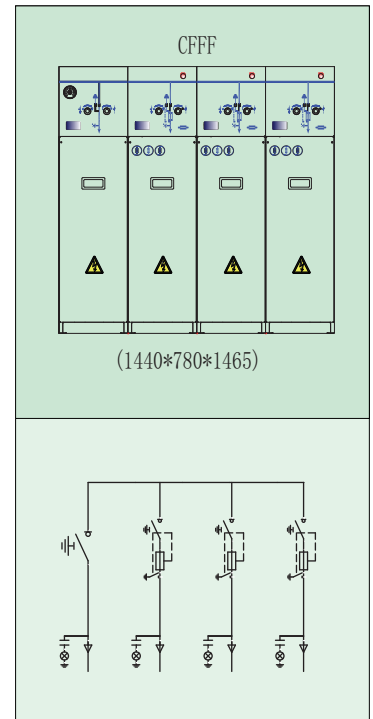
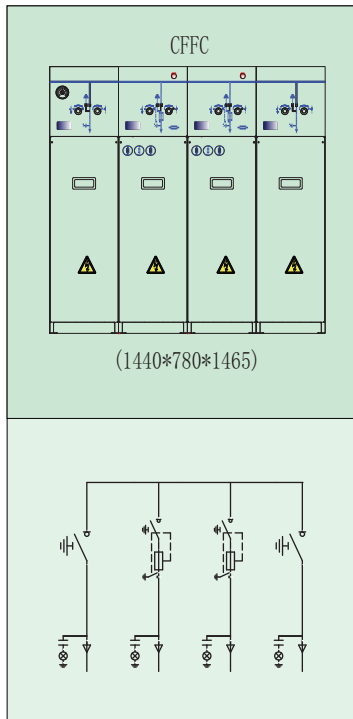
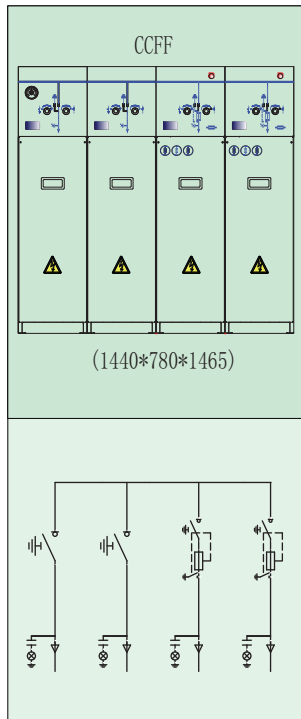
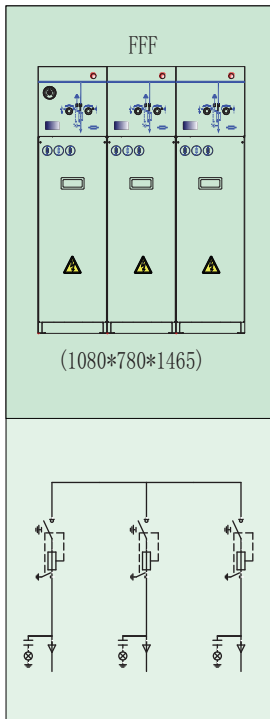
标准组合方案说明 Introduction of Standard Functional Unit Combination

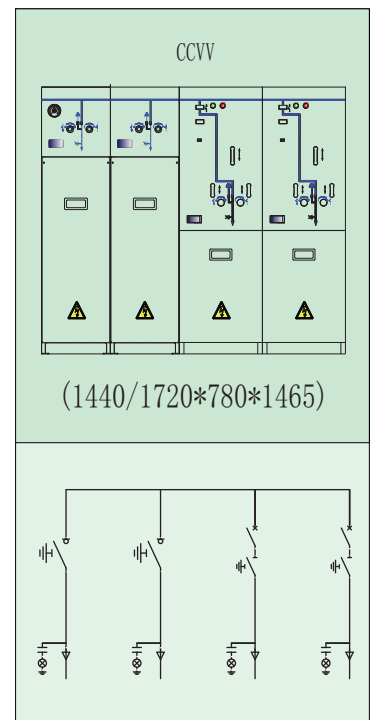
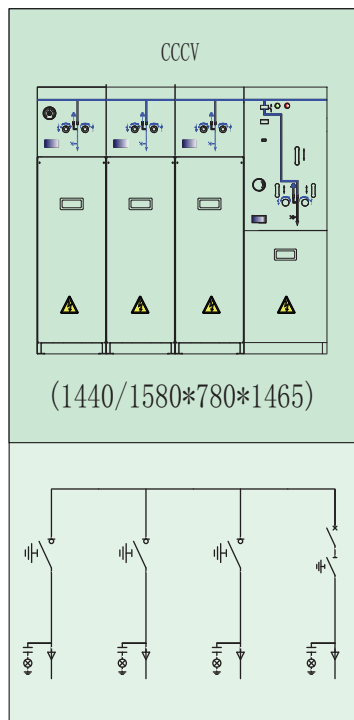
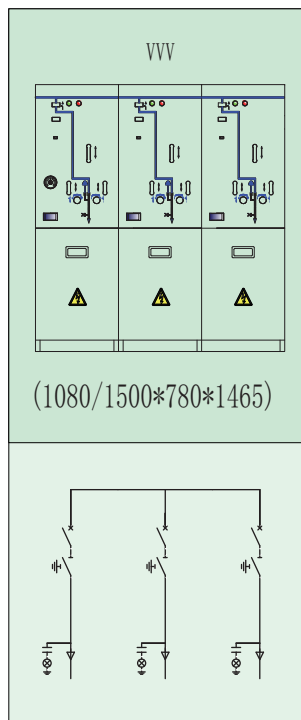
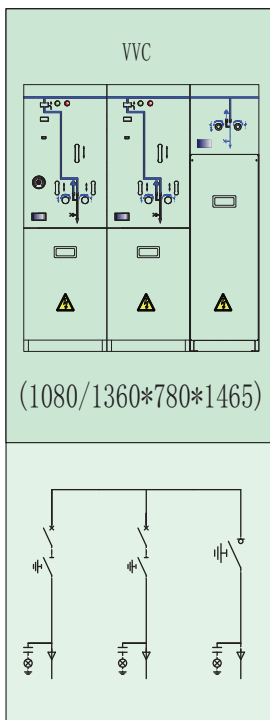
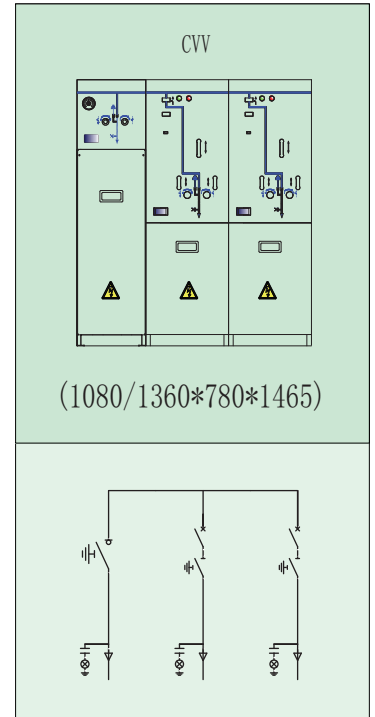
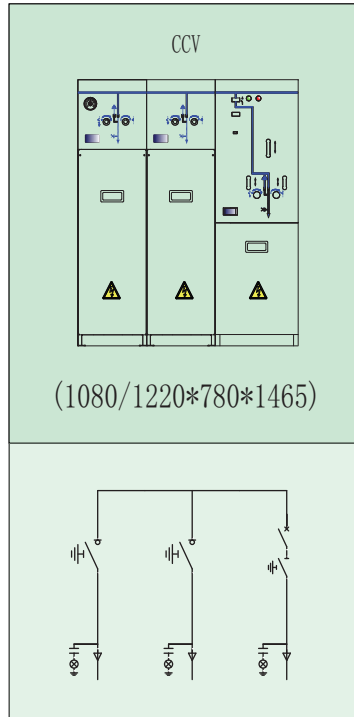
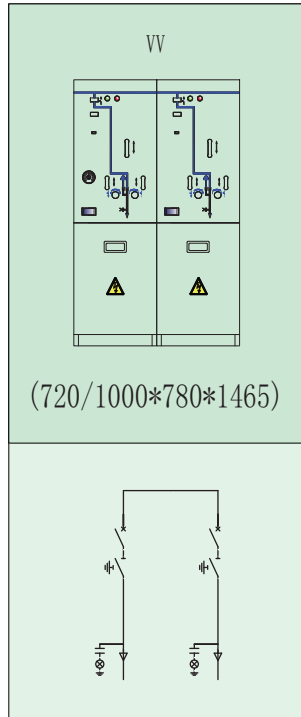
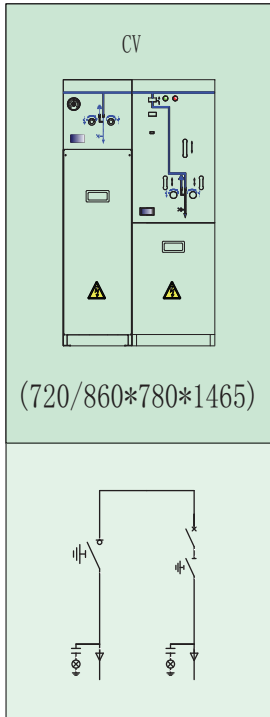
■ DQS 环网柜一个气箱内可布置最多5个单元，按用户要求组合。
推荐标准组合方案多达32种，其应用兴例如下：

■ Users of DQS RMU can design their own block solutions;
one gas tank can contain five units. There are 32 standard combinations in block solution, example as below.

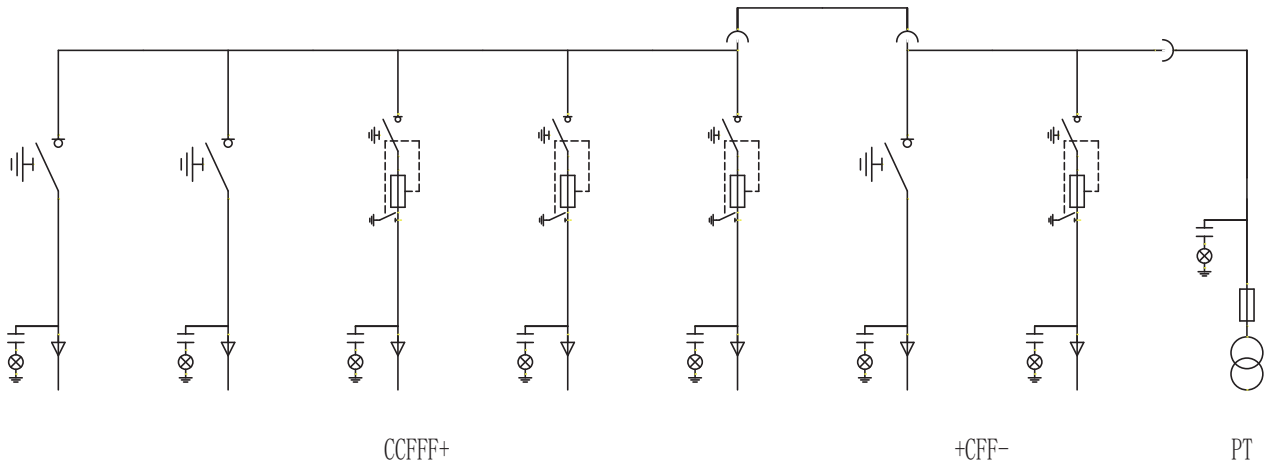






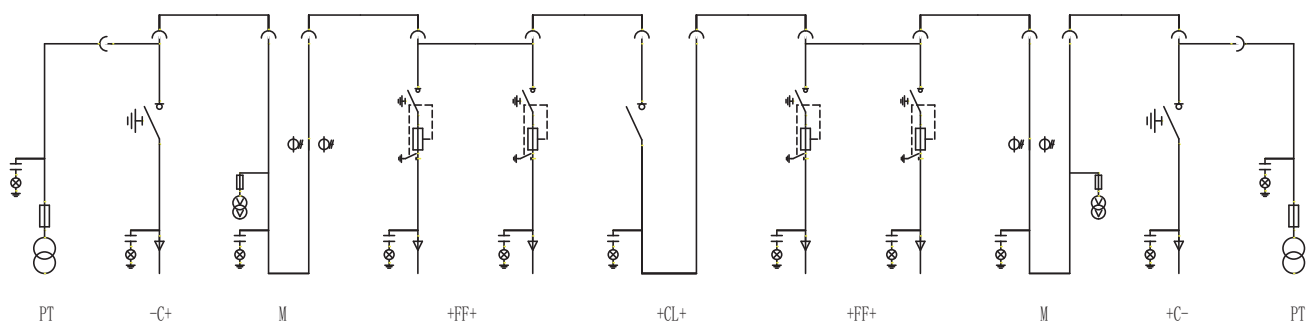


■ 方案2 : CCFFF++CF-PT
Solution2 : CCFFF++CF-PT



- 实施方案 : CCFFF+ 表示 "CCFFF右侧顶部扩展"
+CF- 表示 "CF, 左侧顶部扩展, 右侧侧面扩展"
CCFFF+ Stands for "CCFFF,top extension on right hand side"
+CF- Stands for "CF, top extension on left hand side,side extension on right hand side"

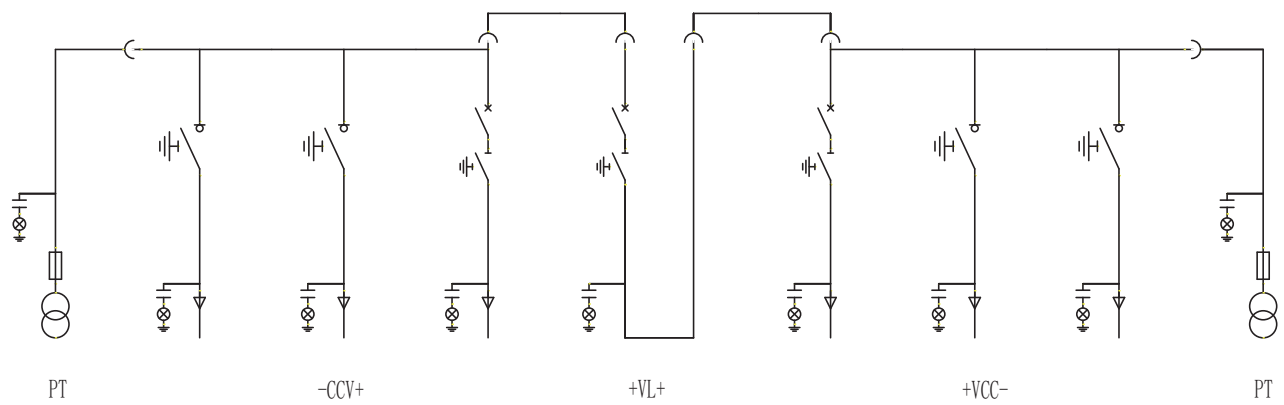
■ 方案3 : 两路进线互为备用, 带高压侧计量
Solution 3 : Two in-lines solution , one line used as standby, and high voltage electric energy measurements



- 实施方案 : -C+ 表示 "C,左侧侧面扩展, 右侧顶部扩展"
+CL+ 表示 "CL, 左侧顶部扩展, 右侧顶部扩展"
+FF+ 表示 "FF, 左侧顶部扩展, 右侧顶部扩展"
-C+ Stands for "C,side extension on left hand side, top extension on right hand side"
+CL+ Stands for "CL,top extension on double left and right sides"
+FF+ Stands for "FF,top extension on double left and right sides"

■ 方案4：带断路器单元开闭所

Solution 4 : General distribution solution, including VCB units;



■ 实施方案：-CCV+ 表示“CCV,左侧侧面扩展,右侧顶部扩展”

+VL+ 表示“VL,左侧顶部扩展,右侧顶部扩展”

+VCC- 表示“VCC,左侧顶部扩展,右侧侧面扩展”

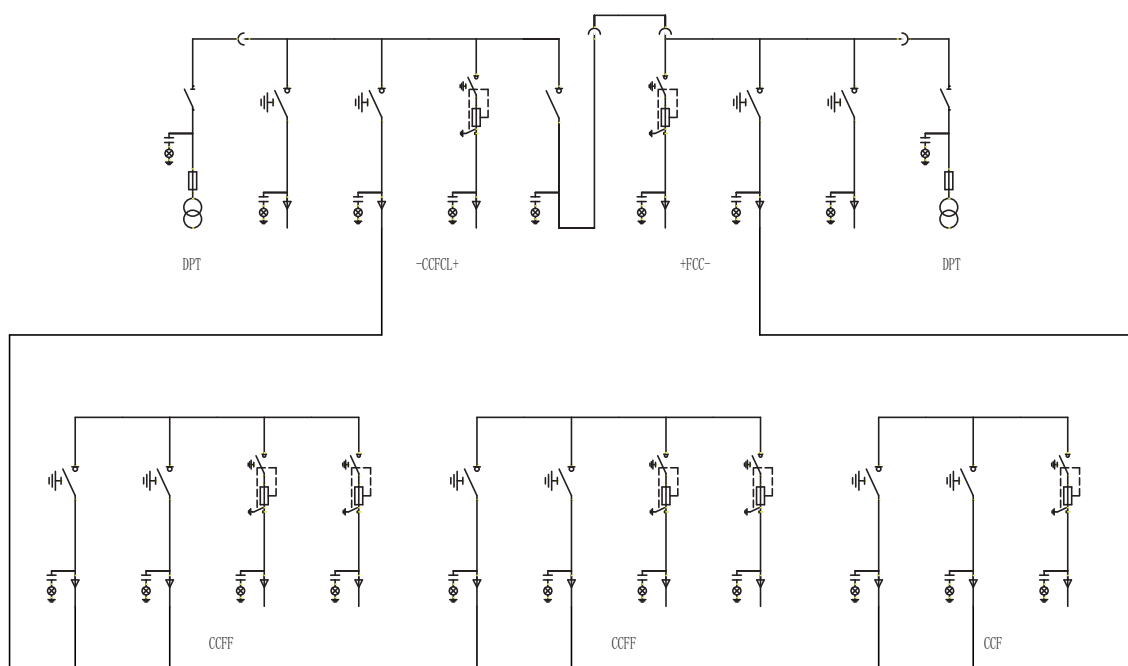
-CCV+ Stands for "CCV,side extension on left hand side, top extension on right hand side"

+VL+ Stands for "VL,top extension on double left and right sides"

+VCC- Stands for "VCC,top extension on left hand side,side extension on right hand side"

■ 方案5：典型环网供电设计方案

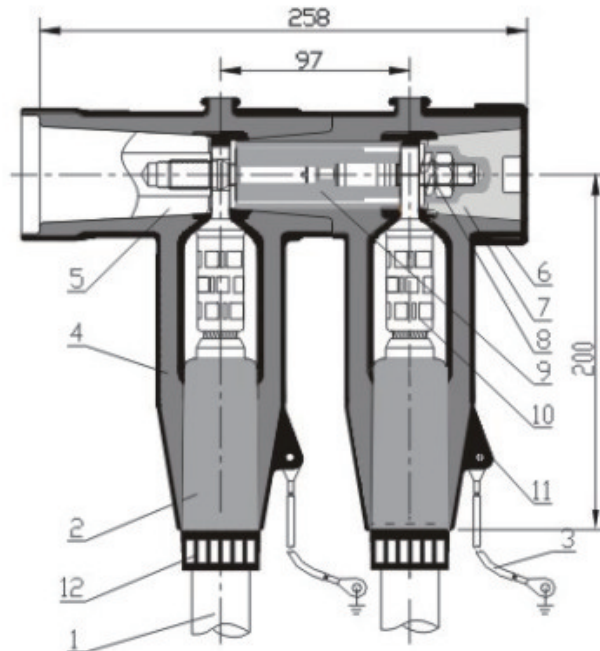
Solution 5 : Typical ring network power supply design;



技术特点 Technical Advantages

扩展方案说明 Introduction of Extension

- DQS 系列气体绝缘环网柜所有单元出线套管采用统一标准的 C 型电缆套管，安装尺寸符合 DIN47636 和 EN50181，推荐采用屏蔽型欧式电缆头，厂家可以根据客户需求，采用国外品牌，也可以采用国产知名品牌。
- 可以提供双电缆进线，带后接式避雷器等特殊方案，需要在订货时明确电缆规格和数量。
- The DQS RMU are equipped with cable bushings which comply with DIN47636 and EN50181, Interface C with M16 x 2 metric threads. The European shielding cable terminations are recommended, which can be matched not only with the foreign brand products, but also with the domestic cable termination products as to meet the different customers' demands.
- Please specify if double set of cables, combination mode rear lightning arrestors or other special demand are needed.



- 具体的尺寸说明和安装要求，见电缆附件厂家资料
Detailed description and installation requirements, see cable connector manufacturer information

短路及接地故障指示器 Combined Short-circuit and earthing fault Indicator

短路及接地故障指示器是用来检测短路及接地故障的设备，这种指示器在单回路中压电网中工作，接地故障最小值是10A，这种指示器应安装在电网的每一个分支上。能检测电网发生故障的区段和故障类型，维修人员可以根据此指示器的报警信号迅速找到故障区段，分断隔离故障区段，从而及时恢复无故障区段的供电。

电子式光纤短路及接地故障指示器具有如下优点：

- 传感器和读数仪表之间的所有连接全部经由光纤，传感器可以直接安装在非屏蔽电缆区域
- 电流的调节，复位时间的调节以及电池的更换都可以不必打开盒子直接操作
- 长效自供电无需外部电源
- 可以提供外部报警信号接点



The short-circuit and earthing fault indicator is a combination unit for detecting short circuit faults and earthing faults. This indicator operates in middle voltage radial networks with one input. The earthing fault current in resistance earthed or fixed earthed networks must be 10A as a minimum. This indication system should be installed in each branch of the network. It is able to rapidly indicate the right position where the fault occurs so that the service personnel could quickly find the fault segment according to the warning indication signal, the separate the circuit from the fault segment for repair, and timely resume the power supply of the normal segments

The electronic optical short circuit and earthing fault indicator has the following advantages:

- All the connections between the sensors and the reading instrument are done via light mains. The sensors can be mounted directly in the unshielded area of the cable
- The adjustment of the currents, reset time and the battery exchange can be carried out without opening the housing
- Self-powered system without external power supply
- External warning signal independent contacts

高压熔断器选型 Fuse Options

DQS 系列气体绝缘环网柜组合电器单元采用变压器保护型,弹簧撞击器式高压熔断器,选配时注意以下参数:

- 额定电压
- 变压器的额定容量
- 熔断器的额定电流
- 熔断器的长度和直径

Switch-fuse combination unit of DQS series Ring Main Unit use transformer protection type fuses with spring type Striker. When choosing the fuse,the following parameter should be considered:

- Rated voltage
- Rated capacity of transformer
- Rated current of fuse
- Size and diameter of fuse

高压熔断器选型表 Fuse table for modules

型号 Type	变压器容量(kVA) Transformer capacity (kVA)	额定电压 Un(kV)				
		6-7.2	10-12	13.8	15-17.5	20-24
XRNT S()LDJ	50	16	10	6	6	6
	75	16	10	10	6	6
	100	25	16	10	10	10
	125	25	16	16	10	10
	160	25	16	16	16	10
	200	40	20	20	20	16
	250	50	25	25	25	20
	315	50	31.5	31.5	25	25
	400	63	40	31.5	31.5	25
	500	80	50	40	40	31.5
	630	100	63	50	50	40
	800	125	63	50	50	40
	1000	-	80	63	63	63
	1250	-	100	80	80	63
	1600	-	125	100	100	80

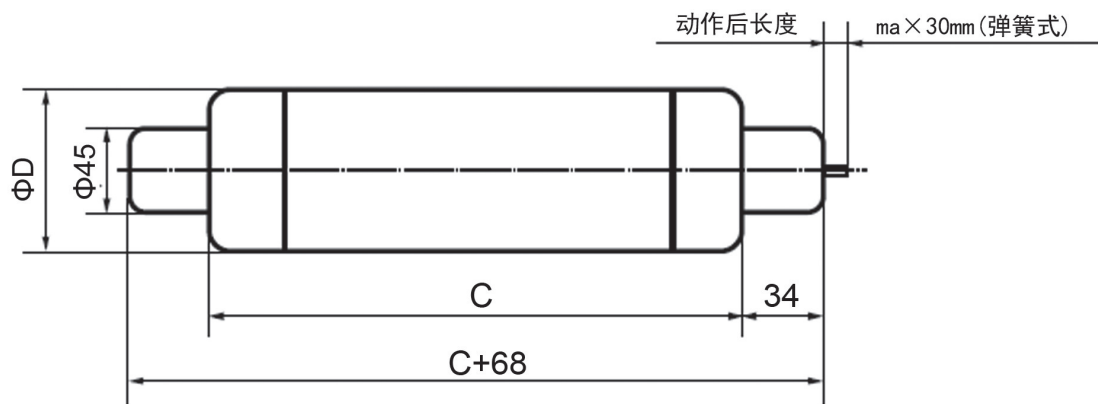
注意:以上数据仅供参考,具体选配时根据所选厂家熔断器的特性曲线确定

Note: The above values are only for reference. In the actual situation,the required fuse is determined according to the characteristics curve of the used fusion tube

高压熔断器选型 Fuse Options

高压熔断器尺寸选配表 Matching table for High Voltage Fuse Sizes

额定电压 Rated Voltage Ur (kV)	熔断器额定电流 Rated current of fuse Ir(A)	C(mm)	D(mm)
12	6.3-63	292	51
	50-125	292	76
24	6.3-31.5	442	51
	40-125	442	76



DQS

电压互感器 Voltage transformer

- 根据用户的需要，可以十分方便的安装电压互感器、电流互感器元件。
- 除采用常规电压互感器JDZ系列型号外，还可以选择特制的电缆插头式电压互感器：JSZV-10R型；大容量供电电源变压器DC-3，单只最大输出达到3kVA。

- The DQS RMU cable compartment size allows for the convenient installation of PT and CT.
- According to the customer's requirements, in addition to the conventional models JDZ type, special specifications of the Cable plug type voltage transformer JSZV-10R and the large capacity power supply transformer DC-3, output capacity up to 3kVA, also can be used.



电流互感器 Current transformer

- 电流互感器根据项目参数需要和安装条件，可以选择开启式，穿芯式，和跑道式产品。

- Core open type, Ring core type and racetrack core type Current transformers can be choose according to project requirements.



电动操作机构 Motorized operation

- 负荷开关单元和组合电器单元标准配置为手动操作机构，也可以选择安装电动操作机构。断路器单元已标配电动储能操作机构，其中分合闸脱扣器，储能电机的额定电压根据项目需要选择。
- 断路器单元隔离开关和所有接地开关只能手动操作。电机操作和合闸线圈电压范围+10%/-15%，分闸线圈工作范围+20%/-35%。
- 电动操作机构很容易分期实现。

- Closing and opening operations of load-break switches and charging of the springs of the mechanisms for the circuit-breaker and the switchfuse combination may be performed with a motor operation.
- Disconnecter in the V-module and all earthing switches do not have this possibility. Test voltage is + 10/ - 15 % for motor operations and closing coils, and + 20/ - 35% for trip coils and opening coils.
- The motorized operation can easily be mounted to the mechanisms after delivery.

电压互感器 Voltage transformer

- DQS系列充气环网柜可以配置两种类型的带电显示器：
- 提示型
- 强制型，带闭锁输出接点



- DQS can be supplied with two different types of capacitive voltage indication systems:
- Presentation type
- Forced locking type , with locking contact



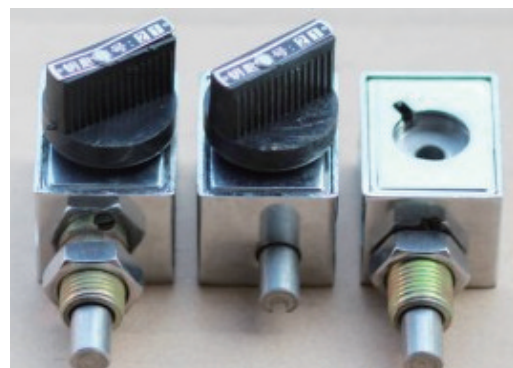
电气闭锁装置 Electronic interlock device

- DQS 环网柜可根据用户需求配套电磁锁或电磁铁，实现闭锁功能。
- DQS RMU can be equipped with electromagnetic lock and electromagnet according to the user's requirements to realize the locking function.



钥匙机械锁 Mechanical key interlocks

- DQS 环网柜可以选择配置钥匙机械联锁，如“两锁一钥匙”，“三锁两钥匙”，防止运行人员误操作造成事故。
- DQS RMU may be equipped with mechanical key interlock, for example "2 lock 1 key" , " 3 locks 2 keys" , according to the customer' s demand, to realize the protection against the personnel erroneous operation and accidents.



SF6 压力指示器 SF6 Manometer

- DQS 环网柜每个充气箱体通常配备 1 只压力指示器，该指示器为压力表形式。此外用户也可以选择配备有报警触点的压力表来指示压力降低。

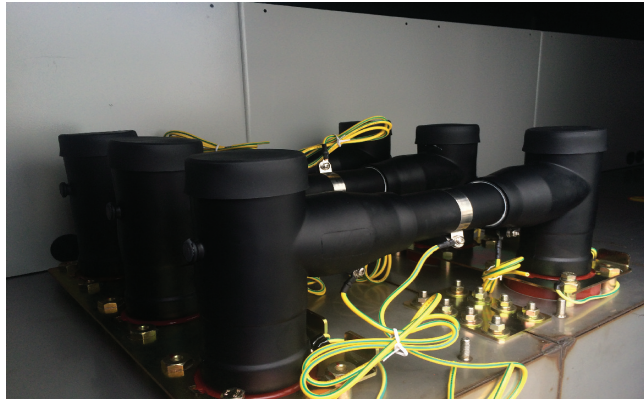
- Each gas tank of DQS RMU is fitted with a SF6 gas manometer. The customers could also select a manometer with low pressure warning signal contacts.



外部连接绝缘母线 External connecting insulated busbar

- DQS 可以配备顶部/侧面连接绝缘母线。

- DQS RMU can be equipped with top/side insulated busbar for busbar extension.



低压室 Low Voltage Compartment

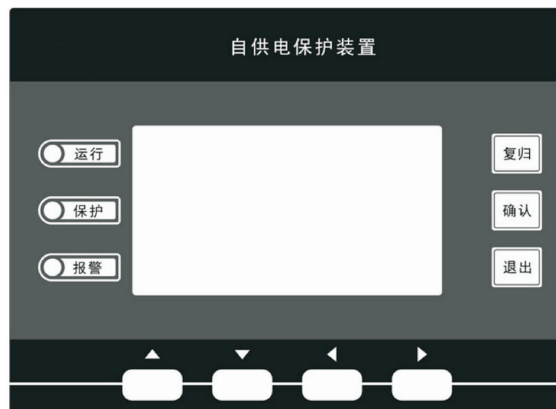
- DQS 环网柜可以配备开关柜顶部的低压箱，用于安装继电保护装置，继电器，电流表等二次元件。
- 标准低压箱高度为 400mm。

- DQS RMU can be equipped with an external low voltage compartment for the microprocessor protection relay, meters or other secondary components.
- The standard low voltage compartment height is 400mm.

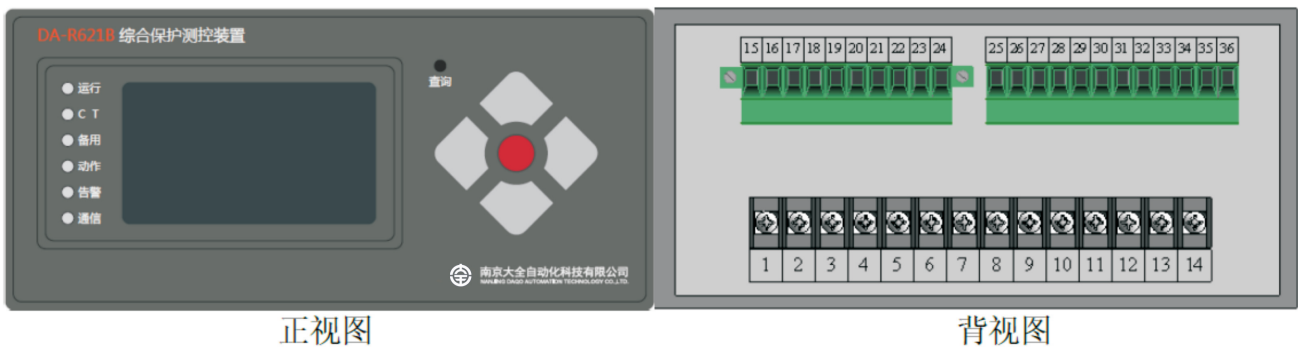
保护继电器 Protection relay

DQS 环网柜断路器单元可以选配两种主要类型的继电保护装置：
DQS RMU can be equipped with two different types of protection relay.

- 自能式保护继电器 主要适用于现场无法提供辅助电源的场所。
- Self powered relays are suitable for rough conditions and places without possibility of auxiliary supply.



- 综合继电保护装置 Integrated protection relay



大全集团INT DA系列保护装置 DAQO INT DA series digital protection relay

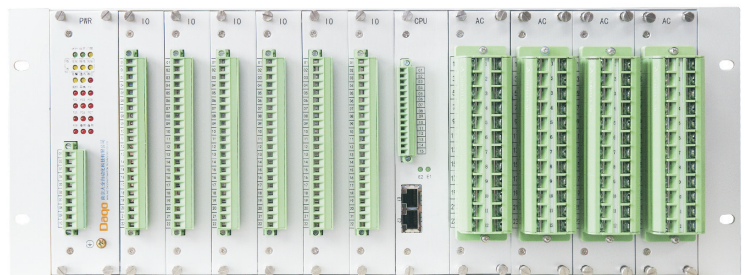
- DA系列数字式保护测控装置 是专门针对 110kV 及以下电压等级智能化电力系统规范设计的综合保护测控装置，集保护、测量、控制、监测、通讯、录波、事件记录等多种功能于一体，型号配置合理，保护功能齐全。装置设计可靠、通用、灵活，支持多种通信接口和通信协议，软硬件功能可扩展配置、可自动识别，具有数字化变电站接口，能同时满足数字化变电站和传统变电站的设计要求。
- DA Series digital protection and control devices are designed for intelligent power distribution networks. DA Series integrates multi-functions of protection, measurement, control, monitoring, communication, wave recording, and events recording. Reliably designed, DA Series supports a variety of communication interfaces and protocols with smart configurations. The Hardware and software featured with auto-recognition properties can satisfy both digital and traditional substation design requirements for the protection and control functions. DA Series is also applicable to the smart substations in most industries.

- 详细信息和保护选型请登录网址 <http://www.nj-int.com/>;
More information and model selection go website <http://www.nj-int.com/>;

遥控与监控单元 Protection relay

■ 大全集团能够为您提供完整的配网自动化解决方案，DQS 系列环网柜非常适用于远程遥控及遥测，能够向 FTU/DTU 装置提供各种信号，并可以接收执行 FTU/DTU 的控制信号。DQS 系列环网柜也可以选配分散式终端控制和监测设备。

■ DAQO offers you a complete power distribution automation system solution. The DQS RMU provides with the advanced remote control and metering interface, which supplies with the relative current, voltage, signal of switch condition to the DTU/FTU device, and simultaneously carries out the control signal. The DQS RMU also can be supplied with distributed remote control and monitoring equipment.



■ DA 系列配网自动化终端 (DTU) 集遥测、遥信、遥控、保护、通讯及电源管理于一体，统一化硬件设计平台，可实现对设备状态、线路电压、电流及其故障的实时监测和远方控制。

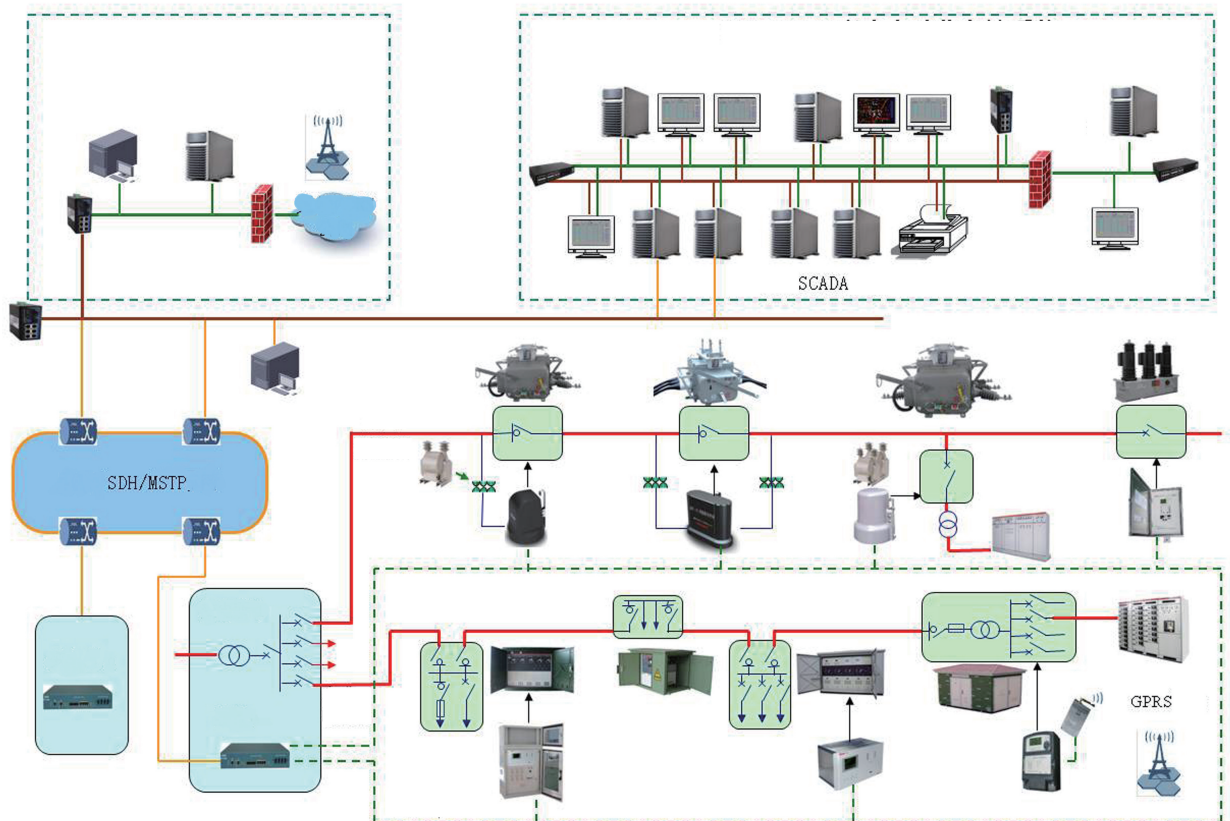
■ 本产品采用 32 位高性能微处理芯片，16 位高精度 A/D 转换芯片和大规模可编程逻辑器件研制的新一代配电终端。

■ DA series distribution network automation unit (DTU) integrates remote communication, remote control, protection, communication and power management functions. The DTU Uses the unified hardware platform, which can realize real-time monitoring and remote control of the equipment condition, line voltage, current and fault.

■ This product uses the 32-bit high performance microprocessor chip, 16-bit high accuracy A/D conversion chip and large scale programmable logic devices and developed as a new generation of distribution network automation terminal unit.

参数指标 Standard functions

- 数据采集
 - 遥测量：24路（电压、电流）；遥信量：4*20路；
 - 遥控量：3*12路；
 - 保护功能：具有三段式电流保护、加速段保护、过负荷保护、重合闸保护、接地保护、零序过压保护、非电量保护、缺相保护、TA/TV监测，具有多定值区；
 - 逻辑功能：具有失压分闸、来压重合闸、瞬压闭锁、闭锁分闸/合闸、失压自投等配网自动化逻辑功能。各保护功能、出口继电器、开入量具有逻辑组态功能，用户可根据现场需要灵活设定。
 - 友好人机界面。
 - 通讯接口多样化：光纤（工业以太网、EPON）、音频电缆、GPRS/CDMA、电缆载波等方式。
 - 本地可配置调试用工业触摸屏，方便工程师查看系统各项数据和进行数据仿真。
 - 详见“大全配网自动化解决方案”。
- Data acquisition: Remote measure: 24 (voltage, current); Remote communication: 4 * 20; Remote control: 3 * 12;
 - Protection function: three-step current protection, accelerating period of protection, overload protection, reclosing protection, earthing protection and zero sequence over voltage protection, non-electricity protection, open phase protection, TA/TV monitoring, with multiple fixed value area;
 - Logic function: loss of subsection brake, voltage on reclosing and instantaneous voltage locking and blocking opening/closing, voltage losing backup auto-activating for distribution network automation. The protective functions, export relay and ON/OFF input has logic configuration function. Users can flexible set the logic according to the site requirement.
 - Friendly human-machine interface;
 - Diversification of communication interface : Optical fiber (industrial Ethernet, EPON), Audio cable, GPRS/CDMA, cable carrier and so on;
 - Configurable local debug industrial touch screen, convenient for engineer to check the system data and simulation data.
 - Detail information see the DAQO distribution automation solutions.



DQK 系列户外开关站 DQK series Outdoor Distribution Substation

- 户外开关站主要由 DQS 系列气体绝缘环网柜和户外箱体构成。
- Outdoor Distribution substation is mainly formed with the DQS series RMU and outdoor enclosure.

正常使用环境: 户外 Normal ambient condition: Outdoor

- 环境空气温度：最高+40°C
最低-10°C
24h 平均温度不超过 35°C
 - Ambient temperature : Max +40°C
Min-10°C
24h average $\leq 35^{\circ}\text{C}$
 - 日平均湿度： $\leq 95\%$
 - Max. Daily average relative humidity $\leq 95\%$
 - 月平均湿度： $\leq 90\%$
 - Max. Month average relative humidity $\leq 90\%$
 - 安装地点无爆炸、火灾危险，无化学腐蚀及剧烈振动
 - No explosion, fire danger, chemical corrosion and violent vibration
 - 外壳防护等级：IP44
 - Inclosure IP code : IP44
- 注：若超出以上正常运行环境，在订货时需要用户与制造商协调处理。
- Except for the above-mentioned conditions , any harsh environmental or special operational condition should be negotiated by the customer and the manufacturer when placing an order.

产品描述 Description of the product

- 箱体外壳可选用多种材料，具有足够的机械强度;
- The customer can choose a variety of materials enclosure
- 箱体的外壳色彩与周围环境相协调
- The enclosure color coordinated with surrounding environment;
- 门有密封措施，并装有把手，并具有足够的强度;
- The access doors shall be provided with door stoppers/retainers, locks and gaskets , and have sufficient strength;
- 箱体顶盖的倾斜度不小于 5 度，并装设防雨檐，箱体内部利于凝露的导流,外壳设置有百叶窗，位置选择保证自然风流通;
- The inclination of the enclosure head is not less than 5 degrees, and fortify the rain eaves, top of the casing for condensation of diversion.Louvers are provided in the external walls of the enclosure, to assure a free circulation of air by natural convection;
- 箱体有可靠的密封性能，能防止电缆沟内的潮气和小动物进入箱体。门设防尘，防小动物金属和防渗，防漏雨措施。外壳防护等级为 IP44
- The enclosure with reliable sealing performance, which can prevent moisture from the cable trench and small animals into the substation.The action of the enclosure doors are against the ingress of sand, dirt, vermin and rain water. The IP code of outdoor enclosure is IP44;
- 箱体应设专用接地导体，该接地导体上设有与接地网相连的固定连接端子
- The substation establish special grounding conductor, the grounding conductor which equipped with fixed connection terminals connected to the grounding network;
- 箱体内部开关 DQS 为 SF6 全绝缘，全密封结构，无需加热器，无凝露问题
- The switchgear is fully SF6 gas insulated RMU DQS, do not need a heater to avoid condensation problems.



常用产品尺寸 Dimension of product

- | | |
|------------------------------------|---------------------------|
| ■ 长*深*高 (L*D*H,mm) =1350*1000*2300 | 三单元C/V(3 units C/V) |
| ■ 长*深*高 (L*D*H,mm) =1750*1000*2300 | 四单元C/V(4 units C/V) |
| ■ 长*深*高 (L*D*H,mm) =2100*1000*2300 | 五单元C/V(5 units C/V) |
| ■ 长*深*高 (L*D*H,mm) =2450*1000*2300 | PT+四单元C/V(PT+4 units C/V) |
| ■ 长*深*高 (L*D*H,mm) =2850*1000*2300 | PT+五单元C/V(PT+5 units C/V) |
| ■ 长*深*高 (L*D*H,mm) =3250*1000*2300 | PT+六个V单元(PT+6 units V) |

■ 此处仅供参考，具体组合所需尺寸请与我公司联系。

Specification above are typical examples,for actual specifications please contact us.

外形尺寸及安装 Dimensions and Installation

方案满足国网标准化定制要求

DQS-12系列12kV充气环网柜外形尺寸 DQS-12 Serie 12kV RMU outline diemension

(产品满足国网标准化安装并柜尺寸要求)

方案① Unit					宽 Width:mm	深② Depth: mm	高③ Height: mm	安装孔间距 Mounting holes distance A: mm
C	F	D	De	Dn	360/375	780/900	1465/1965	335/475
CPT		CL			500/600	780/900	1465/1965	475
V					360/420	780/900	1465/1965	335/400
VL					600	780	1465/1965	575
PT					750	780	1465/1965	650
DPT					800	780	1465/1965	700
M					750	780	1465/1965	650

*1965mm为含二次低压室高度

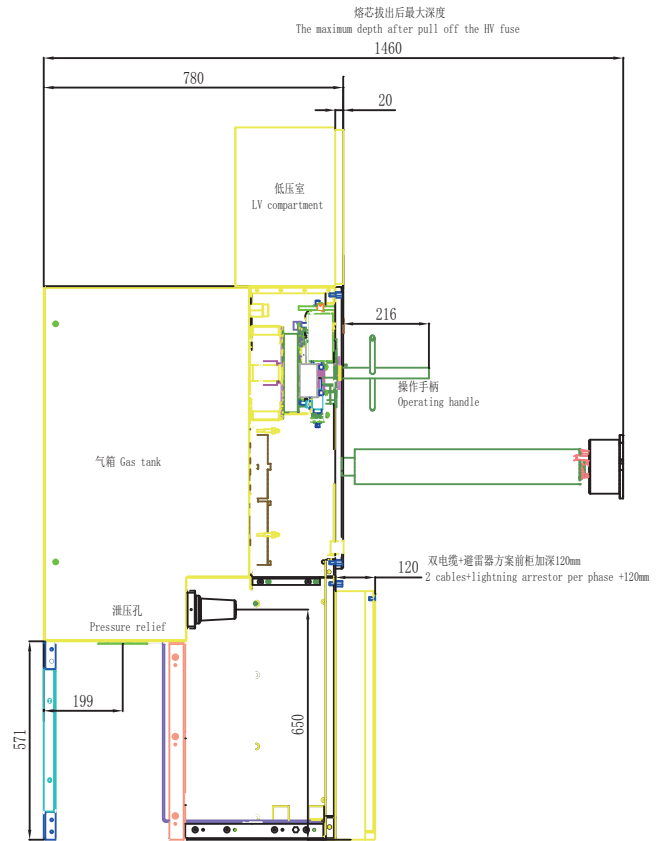
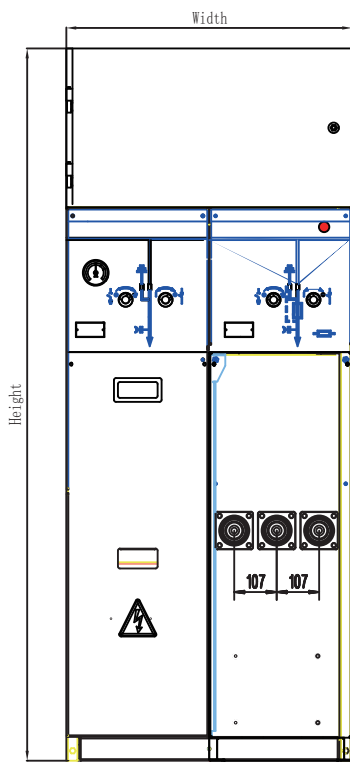
DQS-24系列24kV充气环网柜外形尺寸 DQS-24 Serie 24kV RMU outline diemension

方案① Unit					宽 Width:mm	深② Depth: mm	高③ Height: mm	安装孔间距 Mounting holes distance A: mm
C	F	D	De	Dn	360	780/900	1465/1865	335
CPT					600	780/900	1465/1865	575
V					425/500	780/900	1465/1865	475
PT					1000	1000	1465/1865	900
M					1000	1000	1465/1865	900

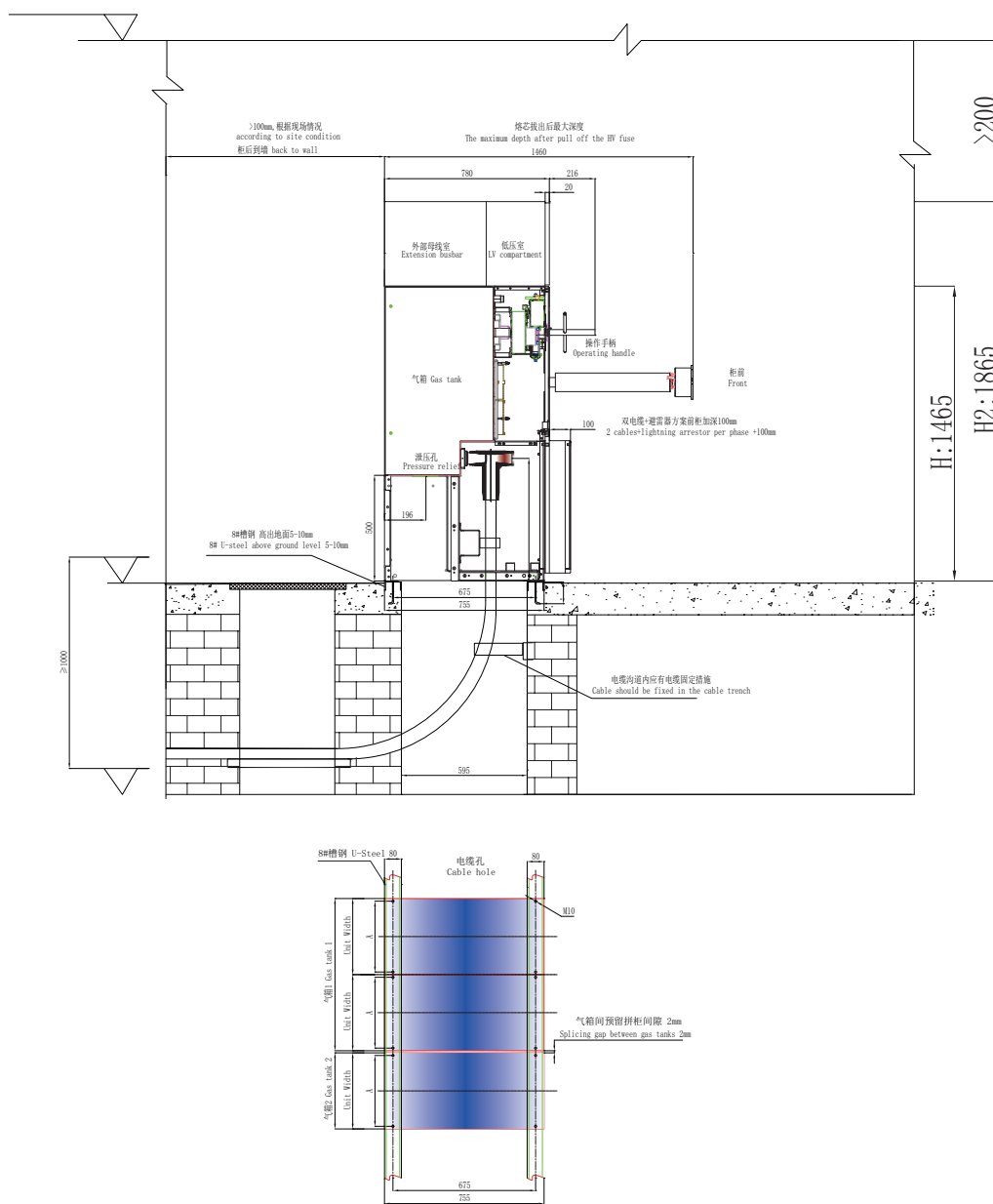
*1865mm为含二次低压室高度

- ① 共箱方案与独立箱体方案具有相同的单元尺寸,
例如共箱方案CF尺寸, W*D*H=720*780*1465/1965 mm
- ② 双电缆+避雷器方案前柜加深120mm
- ③ 高度尺寸根据低压室高度;
- ④ 12kV PT单元宽度根据项目PT选型和母线连接方式

- ① The unit dimension are the same both in share gas tank combination module and separate gas tank module.
For example,share gas tank combination CF , W*D*H=720*780*1465/1965 mm;
- ② The height size according to the low Voltage compartment;
- ③ 2 cables+lightning arrestor per phase depth +120mm;
- ④ Width of 12kV PT unit according to the project PT selection and busbar connection mode.



DQS 系列充气环网柜安装示意图



注意：

- 当使用截面大于240mm²的三芯电缆时，如安装CT，电缆应在电缆沟内分叉并考虑固定；
- 柜子也可以点焊在槽钢上；
- 每隔500mm间距槽钢底部焊接一处钩钉加固；
- 755mm为框架底座深度，675mm为地脚固定螺钉深度间距；
- A尺寸详见P42外形及安装尺寸表

Note：

- When using size larger than 240 mm² triplex cable and needing CTs, Cable should be split and fixed in the cable trench.
- Panels can be also mounted by point welding.
- Welding a hook to reinforce every 500 mm at the bottom of the U-steel;
- 755mm is the panel frame depth.675mm is the depth between anchor fixed screws
- Size "A" can be found in Page 42 , outline dimension.



产品订货须知 Ordering information

订货时需提供下列资料:

- 一次线路系统图，其中包括进线的额定电压，额定电流及短路容量
- 二次线路原理图，其中包括操作、信号、保护回路的额定电流及各种电器元件的型号规格
- 开关柜排列图和布置尺寸
- 柜内电器元件的型号规格数量
- 备品备件清单
- 用户需要的特殊要求，订货时可以与制造厂协商

The following information should be supplied by users when ordering:

- Primary circuit diagram, including rated voltage, rated current and short circuit capacity of incoming line
- Secondary circuit electrical diagram, including the rated current of operation, signal and protection circuit as well as the type and specification of each electric component
- The arrangement of cubicle and layout dimension
- The type, specification and quantity of component inside the cubicle
- Mandatory spare parts list
- If any special requirement, please discuss with manufacturer when ordering

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2020年7月印制



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