



江苏大全长江电器股份有限公司
JIANGSU DAQO CHANGJIANG ELECTRIC CO.,LTD.



 大全集团

DQS-40.5系列SF6全绝缘充气环网柜



大全集团，主要从事高低压成套电气设备、智能元器件及光伏新材料的研发与制造；产业涵盖电气、新能源、轨道交通等领域；公司管理、制造水平及产品质量居行业前列；在全国拥有4大生产基地、23家制造企业、3个研究院、超万名员工；参与国家和行业标准制订11项、承担国家和省部级科技项目54项；先后荣获国家技术发明二等奖、国家科学技术进步一等奖、国家科学技术进步特等奖，是国家企业技术中心、智能制造试点示范、国家绿色工厂、全国用户满意标杆企业。

Daqo is mainly engaged in r&d and manufacturing of high and low voltage electrical equipment, intelligent components and photovoltaic new materials. The industry covers electrical, new energy, rail transportation, etc. Daqo's management, manufacturing level and product quality are in the forefront in the industry. It has 4 major production bases, 23 manufacturing enterprises, 3 research institutes, and more than 10,000 employees. Participated in the formulation of 11 national and industry standards, and undertook 54 national and provincial science and technology projects. It has won the second prize of National Technological Invention, the first prize of National Science and Technology Progress, and the special prize of National Science and Technology Progress. It is the National Enterprise Technology Center, intelligent manufacturing pilot demonstration, national green factory, and national user satisfaction benchmark enterprise.

—— DQS系列SF6全绝缘充气柜 ——

高可靠性

免维护

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江苏大全长江电器股份有限公司，是大全集团的核心子公司，成立于2000年，注册资本1.1亿元，年销售额12亿元，年产能20000台，安全在运行设备已超20万台。公司占地面积5.6万平方米，拥有专业研发、技术人员90人，持续每年投入销售收入的3%-5%用于产品研发创新，拥有专利147件，其中发明专利13件，实用新型专利131件，外观设计专利3件。公司产品通过西高所、苏科院等国家权威实验室认证及ASTA、KEMA、TUV、欧盟CE等国际认证。

JiangSu DAQO ChangJiang Electric CO.,LTD. registered capital is 110 million yuan, Annual sales 1.2 billion yuan, Annual production capacity 200,000 sets, over 200,000 sets are safe working. The company has 90 professional R&D, technicians, and invests 3%-5% of annual sales income in product R&D innovation every year. It has 147 patents, including 13 invention patents and 3 appearance design patents. The products have been tested in XIHARI ASTA, acquired ASTA, KEMA, TUV, and CE international certifications.



Manufacturing of complete sets of high and low components and new photovoltaic materials. The transit and other fields; Company management, the forefront of the industry; The company has 10 enterprises, 3 research institutes and more than 100 employees. The company has participated in the formulation of 11 national and industrial standards, 1 provincial science and technology projects; It has won the National Invention, the first prize of National Science and Technology Award, the Special prize of National Science and Technology Award, Enterprise Technology Center, intelligent green factory, and national benchmark

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...TD. Is the core subsidiary, builded in 2000, the sales 1.2 billion yuan, Annual capacity 20000. The company covers an area of 56000 square meters, investing 3%-5% of sales revenue in product development, including 13 invention patents, 131 utility model patents. The product has already successfully been type tested and obtained CE, TUV, CE and other international certification.

使用环境 Service Conditions	1
标准及规范 Standards and Specifications	2
技术特点 Technical Advantages	3
技术参数 Technical Data	4
结构示意图 Structure Sketch	5
主要元件 Main Components	6
产品方案 Product Description	7
外形尺寸及安装 Diemens and Installation	8
订货须知 Ordering Information	9

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



DQS系列产品概述 Summary of DQS series products

DQS系列产品是有一个完全封闭的系统，其所有带电部件以及一次设备均封闭在不锈钢外壳内，整个装置不受外界环境影响，确保运行的可靠性及人身安全，实现了免维护产品特点。通过选择可扩展母线实现产品的任意组合，实现全模块化。扩展母线采用全绝缘固体母线，确保了高可靠性和安全性。DQS系列开关同时可以提供了自动化方案和智能化方案供用户选择，能够为用户提供更多的增值服务。

DQS-40.5产品适用以下场合

DQS series products have a closed system, all electric parts and primary equipment are enclosed in the stainless steel shell, the whole device is not affected by the external environment, to ensure the reliability of operation and personal safety, to achieve the characteristics of maintenance-free products. Full modularity is achieved by selecting any combination of extensible busbars for products. The extended bus adopts fully insulated solid bus to ensure high reliability and safety. At the same time, DQS series switch can provide automation and intelligent solutions for users to choose, which can provide users with more value-added services.

DQS-40.5 products is suitable for the following occasions.



使用环境 Service Conditions

- 环境温度：
 - 最高环境温度 +65°C
 - 最低环境温度（户内） -40°C
- 环境湿度：
 - 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。
- Ambient temperature
 - Max. +65°C
 - Min.(indoor) -40°C
- Humidity
 - Max. Daily average relative humidity ≤95%
 - Max. Month average relative humidity ≤90%
- Altitude ≤4500m (For above 1000m on demand)
- 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

- GB/T 3906 《3.6 ~ 40.5kV 交流金属封闭开关设备和控制设备》
- GB/T 11022 《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/T 404 《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》
- IEC 62271-100,102,103,200 《高压开关设备和控制设备标准》
- GB/T 3906 Alternating-current metal-enclosed switchgear and controlgear for rated voltages above 3.6kV and up to and including 40.5kV
- GB/T 11022 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
- IEC 62271-100, 102, 103, 200 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，保证运行的高可靠性和人身安全，并实现了免维护；
- 结构紧凑，特别适用于风机塔筒内部、箱式变电站等空间狭小场合；
- 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840A；
- 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。
- 采用压气式负荷开关，灭弧能力强；



- 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 design, available in wind turbine tower and box-type substation applications.
- 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 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 upto 840A;
- 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.
- Pressure-operated load break switch, strong arcing ability.



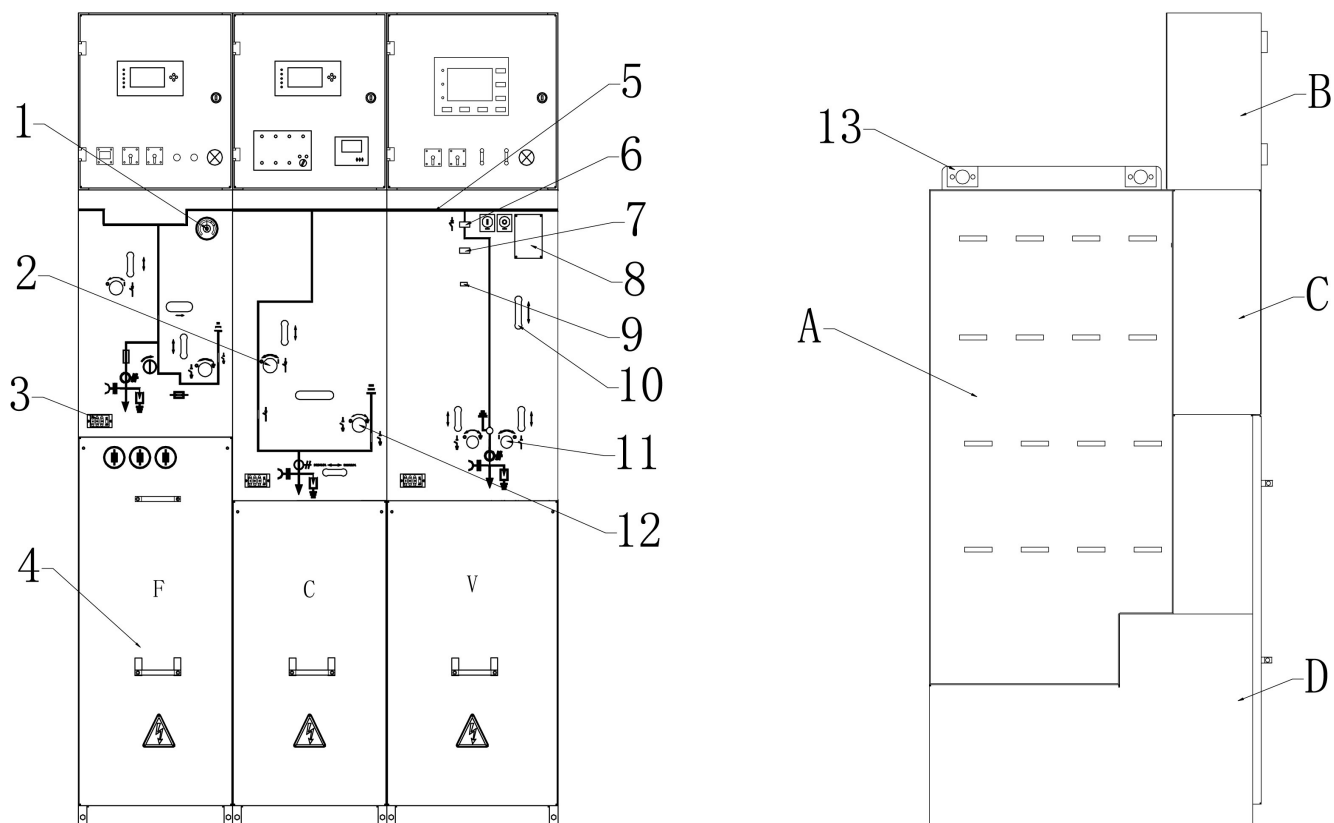
技术参数:40.5KV Technical Data

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	40.5*	40.5*	40.5*
额定频率 Rated frequency	Hz	50/60	50/60	50/60
额定电流 Rated current	A	630	63*	630
额定工频耐受电压(1min) Rated power frequency withstand voltage (1min)	kV	95/118	95/118	95/118
额定雷电冲击耐压(峰值) Rated lightning impulse withstand voltage (peak)	kV	185/215	185/215	185/215
电寿命 Making and breaking operation cycles	Times	E2	E2	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	80*	50/63
额定转移电流 Rated transform current	A		840	
主回路额定短时耐受电流 Rated short-time withstand current of primary circuit	kA	20/4s、25/3s		20/4s、25/4s
接地回路额定短时耐受电流 Rated short-time withstand current of earthing circuit	kA	25		20/25
主回路、接地开关额定峰值耐受电流 Rated peak withstand current of primary and earthing circuit	kA	50/63		50/63
内部燃弧等级 IAC class	kA/s	AFLR,25kA, 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	21		
接地故障电流 Earthing fault breaking current	A	63		
接地故障电缆充电电流 Earthing fault cable charging current	A	36		
外壳防护等级 Enclosure protection degree		IP42	IP42	IP42
气箱防护等级 Gas tank protection degree		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	450	450	500

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

*额定电压 40.5kV 包括 33~38kV Rated voltage 40.5kV cover 33~38kV

结构示意图 Structure Sketch



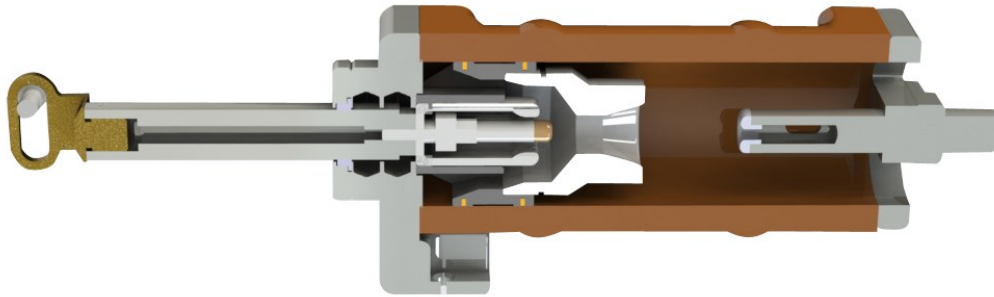
- 1. 气压表
SF6 gas-pressure gauge
- 2. 负荷开关操作孔
Load break switch operating hole
- 3. 带电显示器
Voltage indicator
- 4. 电缆室门
Cable compartment door
- 5. 模拟系统图
Single Line
- 6. 真空断路器分合闸按钮
VCB Opening/Closing button
- 7. 断路器储能指示
Charged spring indicator

- 8. 铭牌
Nameplate
- 9. 计数器
Counter
- 10. 手动储能孔
Manual spring charging hole
- 11. 三工位隔离开关操作孔
3-Position disconnector operating hole
- 12. 接地开关操作孔
Earthing switch operating hole
- 13. 吊环
Lifting lug

- A. 充气箱体
Gas tank
- B. 低压室
Low voltage Compartment
- C. 操作机构室
Operating mechanism Compartment
- D. 电缆室
Cable Compartment

主要元件 Main Components

负荷开关 Load break switch

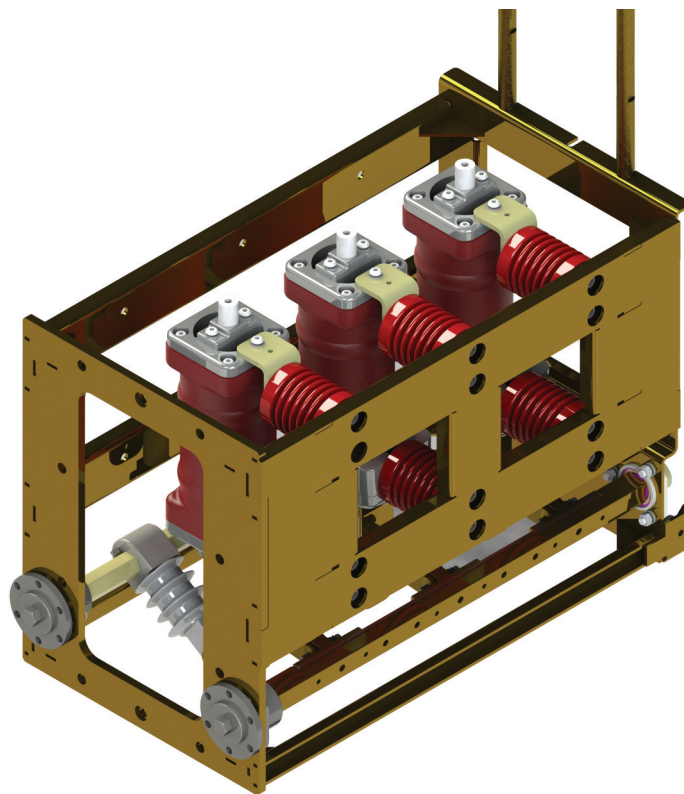


压气式负荷开关:

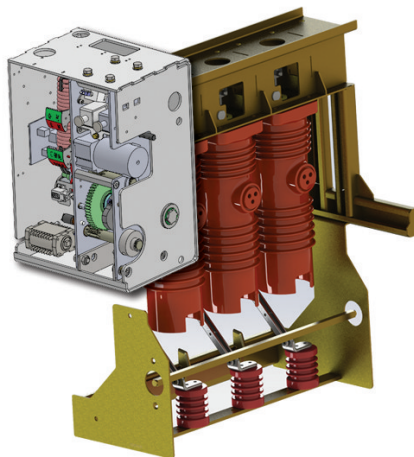
- 两工位：分闸、合闸
- 灭弧能力强
- 接地开关和负荷开关操作独立

Puffer type load break switch

- Two-position: Open and Close
- Strong arcing ability
- Separate earthing switch and load break switch



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，侧装于气室内，减少了开关柜的宽度
- 操作机构安装在气室外，便于检修
- 操作机构与断路器利用直动波纹管连接，传递动力
- 免维护（导电部件）

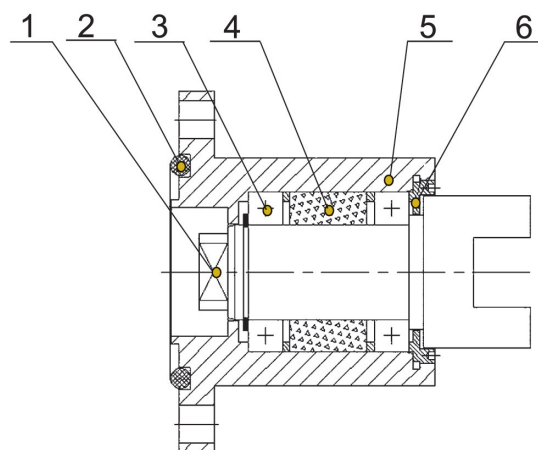
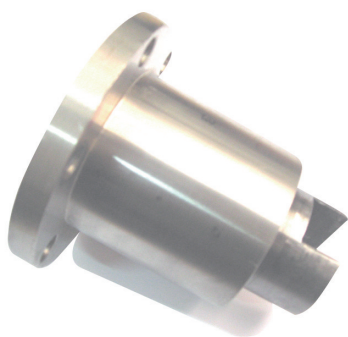
Vacuum circuit-breaker characteristics:

- Vertical arrangement of circuit breaker three phase poles are mounted in the air chamber according to decreasing by switchgear width
- Operating mechanism is installed outside the gas compartment, easy repair.
- Operation mechanism and VCB main part are connected by straight moving bellows transmitting force.
- Maintenance-free (conductive part)

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 voltage performance



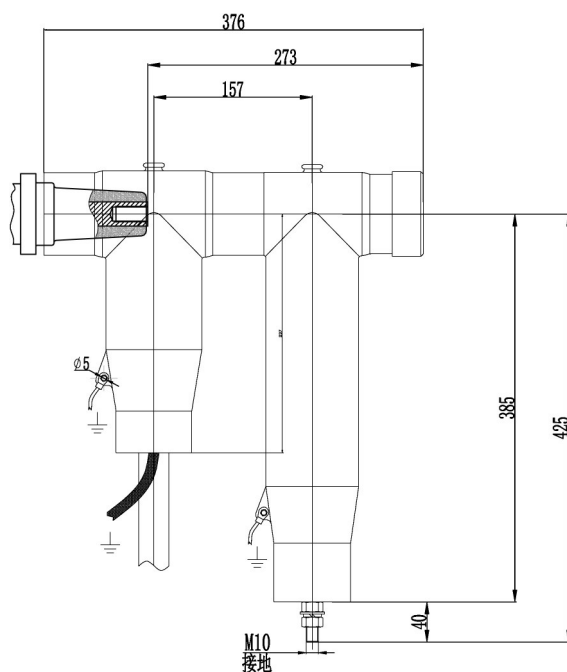
1. 主轴
Main shaft
2. 密封圈
Sealing loop

3. 轴承
Bearing
4. 磁流体
Magnetic fluid

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

电缆附件和避雷器 Cable termination and lightning arrestor

- 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



IMU 智能监测单元

■ IMU 智能监测单元集成在中压断路器内部，具有分合闸线圈电流监测、储能电机电流监测、断路器机械特性监测等功能，实现定期计划检修向预测检修的转变，实时掌握设备特性状态，按需维修，避免设备过度维修和带故障运行。

■ IMU intelligent monitoring unit is integrated in the medium voltage circuit breaker, and has the functions of coil current monitoring, energy storage motor current monitoring, circuit breaker mechanical characteristics monitoring, etc., to realize the transformation from regular scheduled maintenance to predictive maintenance, real-time grasp of equipment characteristics, maintenance on demand, to avoid excessive maintenance and failure operation of equipment.



局放监测单元

■ 开关设备局部放电在线监测装置（IED），进行放大、滤波、检波，数字脉冲提取、数字滤波、局放特征量计算等数字化处理，并完成局放可视化操作、局放判断、数据存储、数据上传等功能。

■ IED has function of amplification, filtering, detection, digital pulse extraction, digital filtering, local discharge characteristic calculation and other digital processing, and complete the local discharge visual operation, local discharge judgment, data storage, data transmission and other functions



触控显示单元

■ 触控显示单元与智能化元器件通过 RS485 通信接口进行通信，将开关设备温湿度、绝缘特性、断路器机械特性及触臂温升等参数进行实时监测以及多画面切换等。能直观显示一次回路模拟系统图及各个回路的运行状态，并将测量到的电参量直接显示于人机界面并适时刷新显示，并对重要的数据、曲线进行存储，同时支持历史数据查询、参数、标准曲线范围校验、诊断等功能。

■ The touch display unit communicates with the intelligent components through the RS485, and monitors the temperature and humidity of the switch equipment, insulation characteristics, mechanical characteristics of the circuit breaker and the temperature rise of the contact arm and other parameters in real time as well as multi-screen switching. It can intuitively display the simulation system diagram of the primary circuit and the running state of each circuit, and the measured electrical parameters are directly displayed in the man-machine interface and timely refresh display, and the important data, curve storage, while supporting historical data query, parameters, standard curve range calibration, diagnosis and other functions.

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:

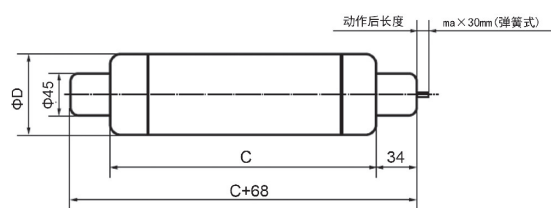
- Rated voltage
- Rated capacity of transformer
- Rated current of fuse
- Size and diameter of fuse

高压熔断器选型表 Fuse table for modules

型号 Type	变压器容量(kVA) Transformer capacity(kVA)	额定电流 Ir(A)
XRNT	100	6.3
	125	10
	160	10
	200	16
	250	16
	315	20
	400	25
	500	25
	630	31.5
	800	31.5
	1000	40
	1250	50
	1600	63
	2000	63

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)
40.5	6.3-16	537	51
	20-63	537	76



电压互感器 Voltage transformer

■ 采用常规电压互感器 JDZ 系列

■ Use the conventional models JDZ type.



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。

■ 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.

■ 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.

带电显示系统 Voltage indication system (VPIS)

■ 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:

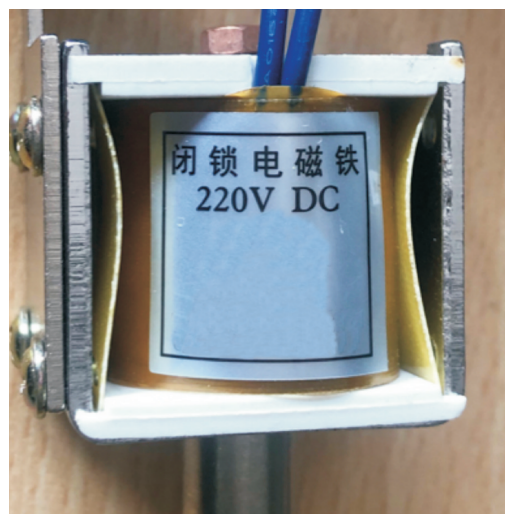
- Presentation type
- Forced locking type , with locking contact



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、电磁铁或机械锁，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.



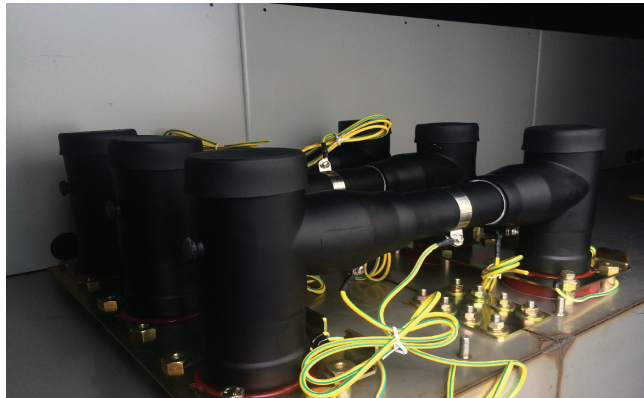
SF6 压力指示器 SF6 gas-pressure gauge

- 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室，用于安装继电保护装置，继电器，电流表等二次元件。
- DQS RMU can be equipped with an external low voltage compartment for the microprocessor protection relay, meters or other secondary components.
- 标准低压室高度为 400mm。
- 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.

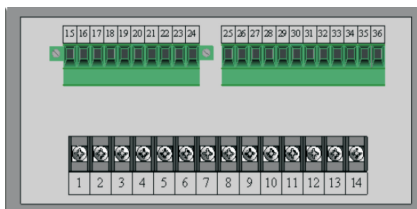
- 自能式保护继电器 主要适用于现场无法提供辅助电源的场所。
- Self powered relays are suitable for rough conditions and places without possibility of auxiliary supply.



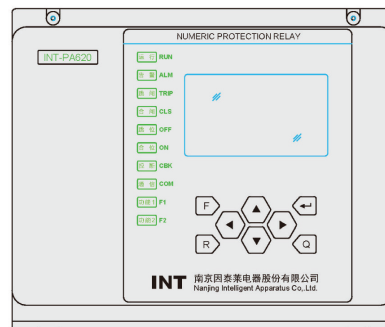
- 综合继电保护装置
Integrated protection relay



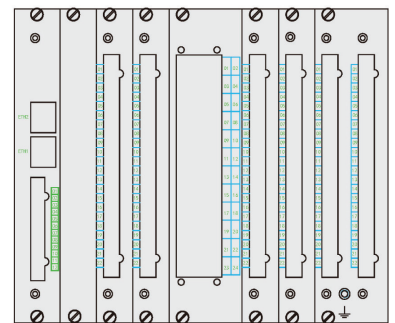
正视图



背视图



前面板图



后面板图

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.

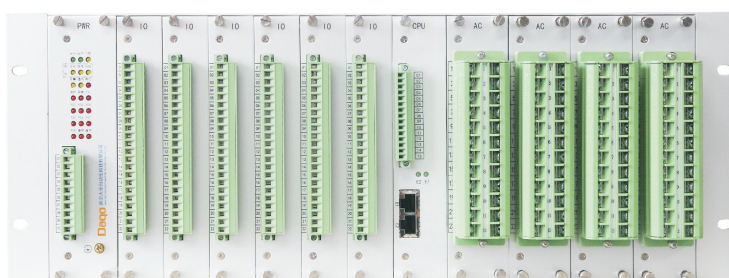
- 详细信息和保护选型请登录网址 <http://www.nj-int.com/>;

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;

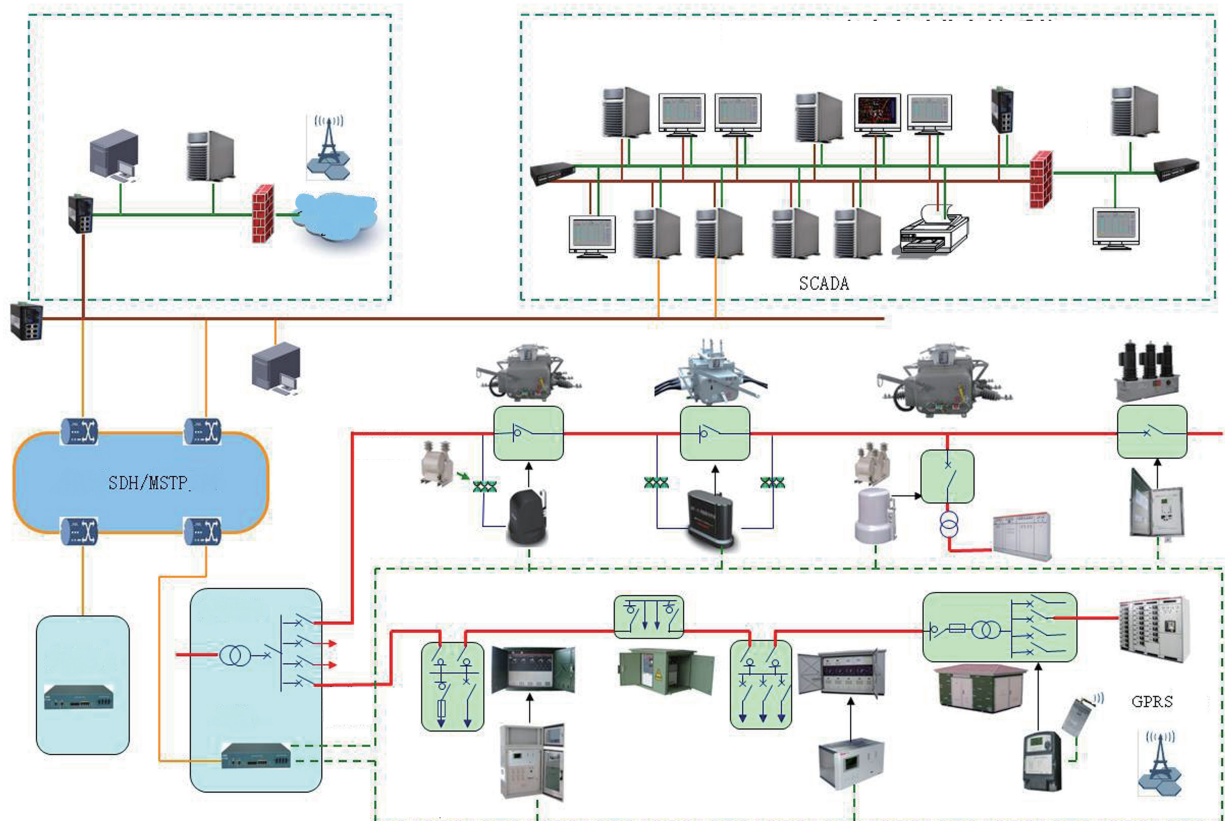
■ Logic function: loss of subsection brake, voltage on reclosing and instantaneous voltage locking and blocking opening/closing, voltage losing backup auto-activating for distribution network automation. The protective functions, export relay and ON/OFF input has logic configuration function. Users can 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.

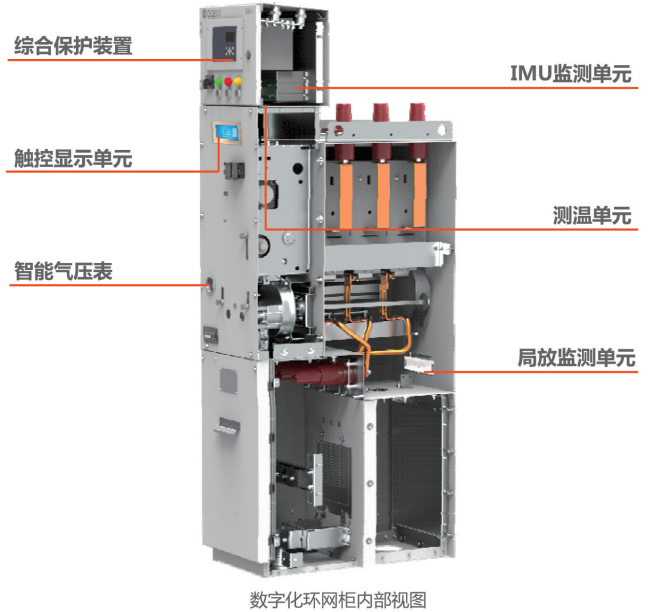
■ Detail information see the DAQO distribution automation solutions.



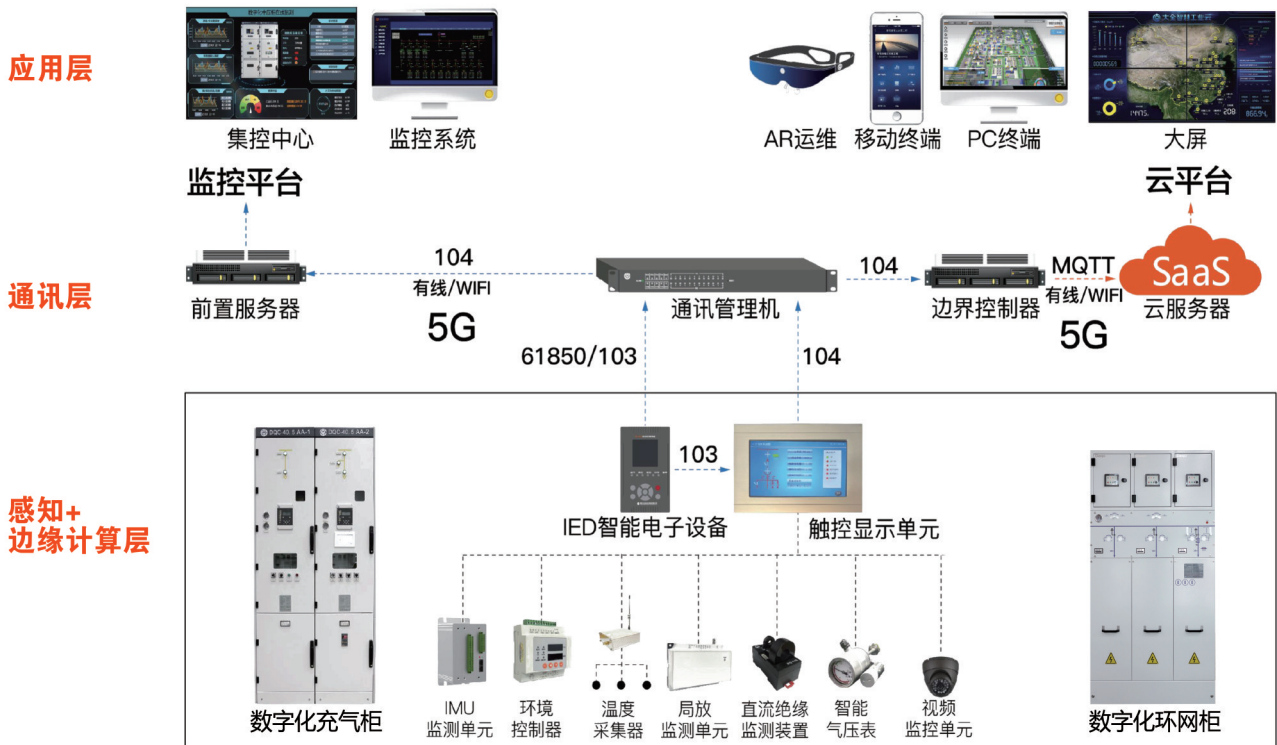
数字化中压柜 Digital medium pressure cabinet

大全新一代数字化中压柜在传统机械联锁、抗燃弧、抗震等方面进行了全面升级，产品操作简便，运行更安全。通过配套智能化器件，可以实现开关柜温度、断路器机械特性、分合位置等参量的感知知用功能。使用数字化中压柜，用户不仅可以实现自动采集所有数据，还能存储和分析这些数据，以便工作人员用它做出决策，从而降低综合成本。

DAQO new generation digital medium pressure switchgear has been fully upgraded in conventional meachnical interlocking、Arc resistance and Aseismatic function,it' s easy to oprate and safer to run.This switchgear can realize the sensing function of switchgear temperature、circuit breaker mechanical characteristics、opening and closing position and other parameters by supporting intelligent devices. Users can not only collet all data automatically , but also store and analyse the data for making decison,thereby reducing costs through useing digital medium pressure switchgear.



数字化中压柜应用系统方案



数字化中压柜以及数字化系列产品在大全集团新疆园区、重庆园区、南京园区、扬中园区全面应用和示范。实现了设备的数字铭牌、状态评估、预测性维护和远程运维指导，为设备全生命周期管理提供了数字化基础。实现了百万点的电力集中监控、配电系统能耗分析及优化。根据特殊需求实现模块化定制，充分保障数据产权和数据安全。

Digital medium voltage cabinet and digital series of products in DAQO XingJiang park, ChongQing park, NanJing park and YangZhong park comprehensive application and demonstration. The digital nameplate, status assessment, predictive maintenance and remote operation and maintenance guidance of the equipment are realized, which provides a digital basis for the whole life cycle management of equipment. Centralized monitoring of millions of points of power, energy consumption analysis and optimization of power distribution system are realized. Modular customization is realized according to special requirements to fully protect data property rights and data security.



数字化解决方案 Digital solutions

- 大全集团的数字化解决方案采用配电物联网架构，即“系统应用、通讯管理、边缘计算、电气端设备”，以全系列的数字化产品为基础，支撑电力监控、设备运维、能源管理等系统及应用，提供数字化变电、智慧供配电、智慧用电等应用场景的整体解决方案。
- Daqo digital solutions using Power distribution architecture, means "system application, communication management, calculation, electrical equipment", on the basis of a full range of digital products, electric power monitoring and equipment operations, energy management system and application of digital substation, power supply, wisdom electricity application scenarios, such as the overall solution.
- 电力监控系统对电源、供配电设备、用电负荷等进行实时监视和控制，确保本地系统安全运行。
- The power monitoring system monitors and controls the power supply, power supply, distribution equipment and power load in real-time to ensure the safe operation of the local system.
- 设备运维系统提供各类电气设备的数字厂牌、设备故障诊断、预测性维护、专家远程指导等服务，全方位提升用户的运维能力。
- The equipment operation and maintenance system provides all kinds of electronic equipment digital brand, equipment fault diagnosis, predictive maintenance, expert remote guidance and other services, comprehensively improves the user's operation and maintenance ability.
- 能源管理系统对多种能源系统进行实时监控和统计分析，通过多能互补与多元协同控制，实现节能降耗、“双碳”达标。
- Energy management system for a variety of energy systems for real-time monitoring and statistical analysis, through multi-energy complementary and multi-collaborative control, energy saving and consumption reduction, "double carbon" standards.

技术特点 Technical Advantages

状态监测 Condition monitoring

- 设备具备状态在线监测功能。可以全方位进行数字化采集、状态监视、无线测温、故障预警与健康状态评估。

及时提醒并指导运维人员进行检修及故障处理，极大提高了配电房综合运维效率，将维护检修模式从“计划检修”向“状态检修”的转变。

- The device has the function of online monitoring.It can realize function of digital acquisition,condition monitoring,wireless temperature measurement,fault warning and health status assessment.

Promptly remind and guide the operation,maintenance personnel to repair and troubleshoot,greatly improve the comprehensive operation and maintenance efficiency of the power distribution room,and transform the maintenance mode from planned maintenance and state maintenance.



预防性维护 Preventive maintenance

- 根据设备状态，评估出设备风险等级，系统自动分级发送相关信息，一级为自动语音拨号、二级为短信推送，三级为无声屏幕推送，警示工作人员予以操作运维。

- According to the equipment status, the risk level of the equipment is assessed,and the system automatically classified the information related to startup.level 1 is automatic voice dialing,level 2 is note push,level 3 is silent screen push,warning staff to operation and maintenance.



AR远程指导 AR Remote mentoring

- 运用增强现实、音视频实时通讯等技术，提供可视化巡检、共享视界专家远程指导、远程验收、远程培训等围绕设备本体的动态信息发布及交互式运维功能，优化项目现场的数字化中压柜运维效率，扩展操作人员的能力范围。

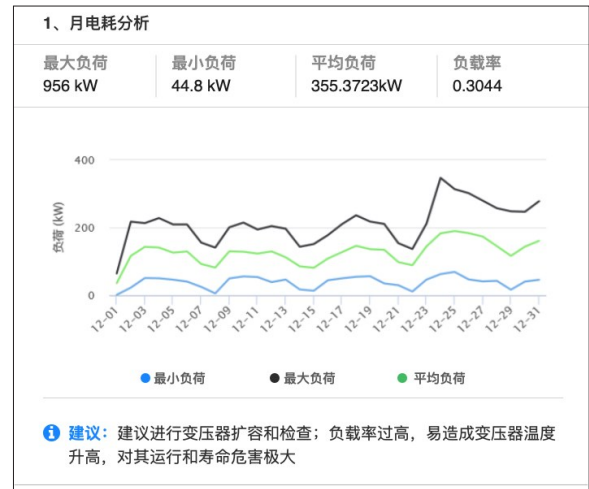
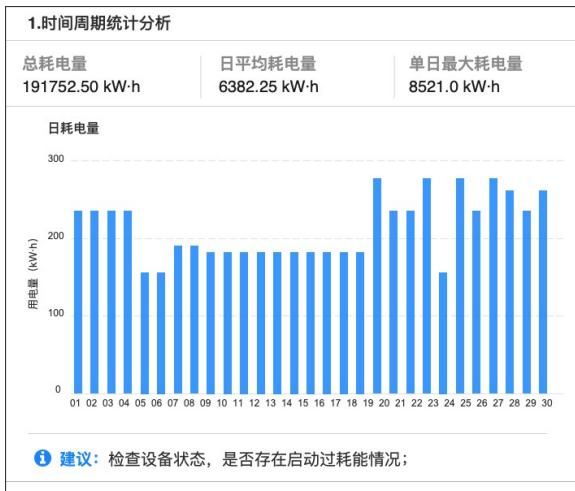
- Augmented reality, audio and video communication and other technologies are used to provide dynamic information release、 interactive operation、 maintenance functions centering on equipment ontology,such as casual inspection,remote guidance by shared vision experts,remote acceptance,and remote training,so as to optimize the operation and maintenance efficiency of digital medium-voltage switchgear on the project site and expand the scope of operator' s ability.



能耗分析 analysis of energy consumption

- 能耗分析系统以直观的数据和图表对电能质量、电量消耗、负荷特性、异常耗损等进行分析，给出优化提升建议。

- The energy consumption analysis system shows power quality, power consumption, load characteristics, abnormal loss, etc. with intuitive data and charts, and give suggestions for optimization and improvement.



定制功能 Custom function

- 根据客户需求对原有设备进行智能化改造，加装智能元件或传感器。
- 轻松更换和升级已有开关设备中的部件和装置。
- 通过软件更新添加新功能，无需升级整个系统。

- According to customer demands, the original equipment for intelligent transformation, add intelligent components or sensors.
- Easily replace and upgrade components and devices in existing switchgear.
- Add new features through software updates without upgrading the entire system.

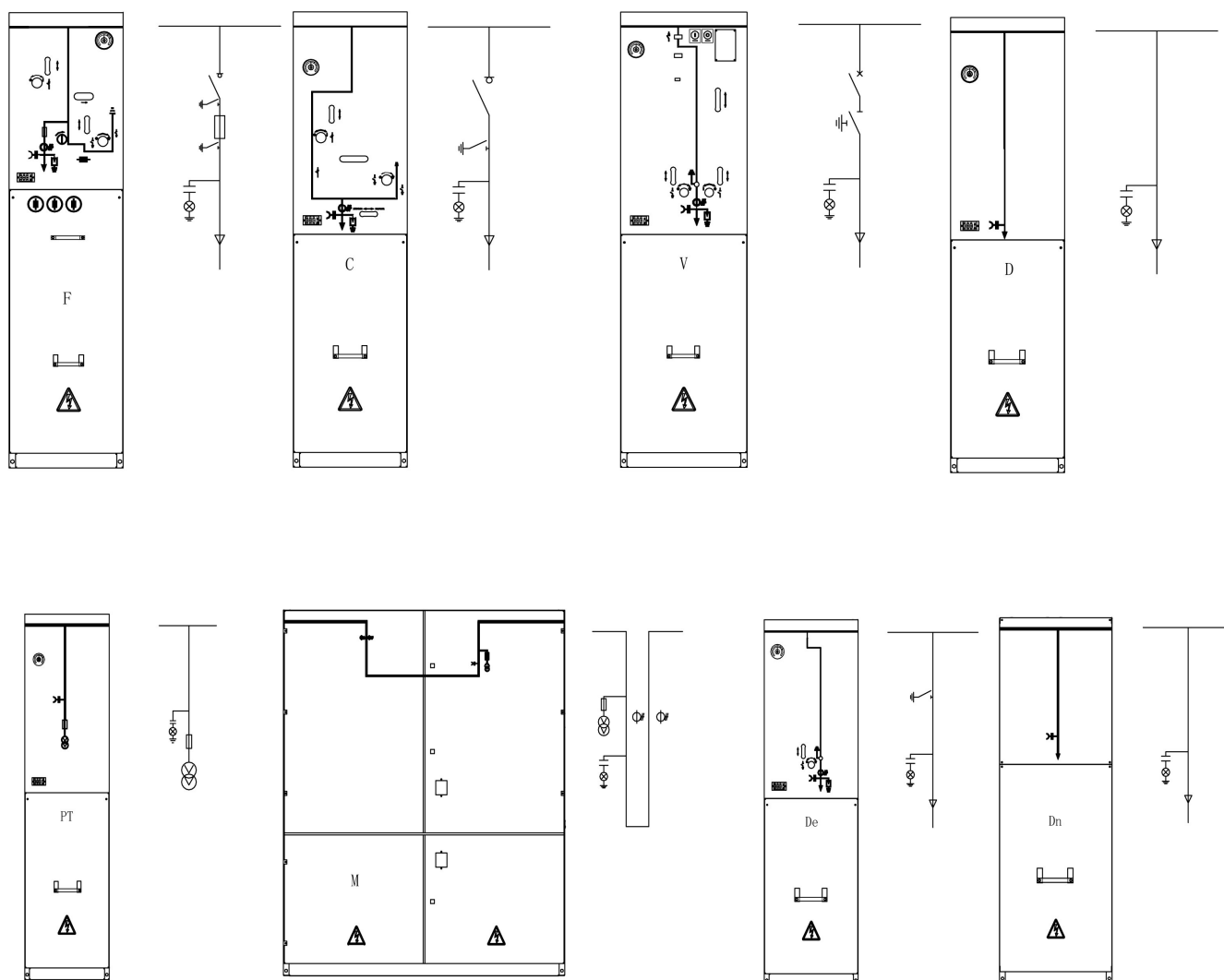
数据安全 Data security

- 具备公安部信息安全等级保护证书，确保用户的数据安全。
- 设备告警分级管理，确保数据提示正确性和可靠性。
- 电子设备操作票统一流程管理，确保人身安全。

- With the ministry of public security information security level protection certificate, to ensure user data security.
- Hierarchical management of device alarms ensures the correctness and reliability of data prompts.
- Electronic equipment operation ticket unified process management, to ensure personal safety.

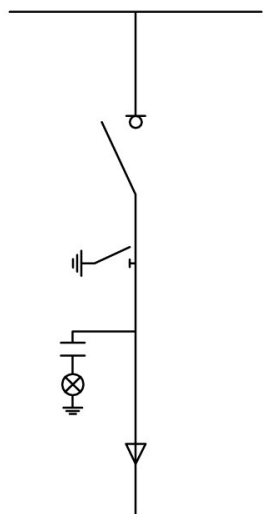
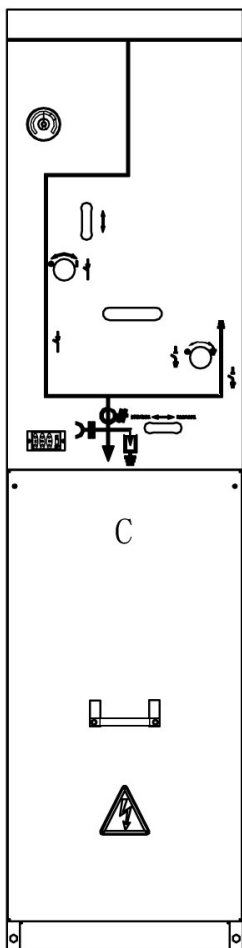
产品方案 Product Description

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 |
| ■ CPT 带负荷开关电压互感器单元 | ■ CPT-Voltage transformer with LBS unit |
| ■ PT 带开关电压互感器单元 | ■ PT-Voltage transformer 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:

- 三工位负荷开关+接地开关
- 负荷开关弹簧操作机构
- 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气压表（共箱时每个气箱配一只气压表）
- 接地母线
- 接地开关与电缆室前下门的联锁

可选配置:

- 取消接地开关及联锁
- 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
- 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 6NO+6NC
- 接地开关位置 2NO+2NC
- 带信号的气压表 2NO
- 二次装置

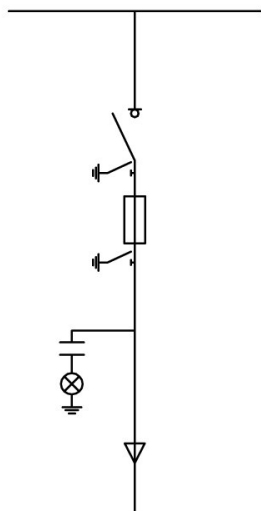
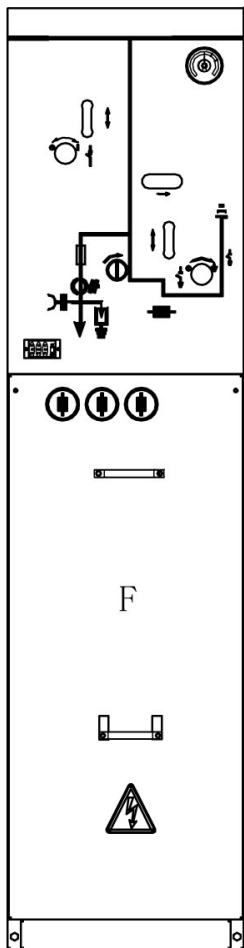
Standard configuration and characteristic:

- Three-position load break switch and separate earthing switch
- Single-spring operating mechanism for load break switch
- 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 Manometer (only one each SF6 tank)
- Earthing busbar
- Interlock between ES and cable compartment door

Optional features:

- Cancel the earthing switch and interlock
- Bushings for connection of external busbars 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 and amperemeter
- Touchable cable termination kits
- Back connection type lightning arrester or double cable connection
- Key interlock
- Interlock of incoming earthing switch DC24/48/110/220V,AC110V/220V
- Auxiliary contacts
- Position of LBS 6NO+6NC
- Position of ES 2NO+2NC
- Signal from manometer indicator 2NO
- Secondary device

负荷开关-熔断器组合电器单元 DQS-F Fuse-Switch Unit DQS-F



标准配置:

- 630A 母线
- 三工位负荷-熔断器组合电器，主接地开关及熔断器两端机械
- 联动接地开关
- 负荷开关弹簧操作机构
- 负荷开关和接地开关位置指示
- 熔丝筒
- 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 气压表（共箱时每个气箱配一只气压表）
- 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
- 后接式避雷器
- 钥匙互锁
- 辅助触点
 - 负荷开关位置 6NO+6NC
 - 接地开关位置 2NO+2NC
 - 带信号的气压表 2NO
 - 熔断器熔断 1NO
- 二次装置

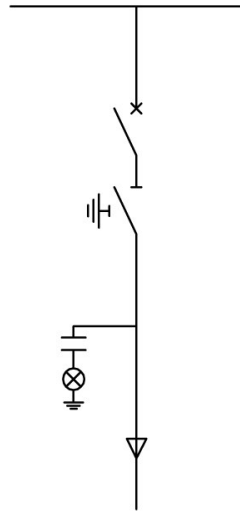
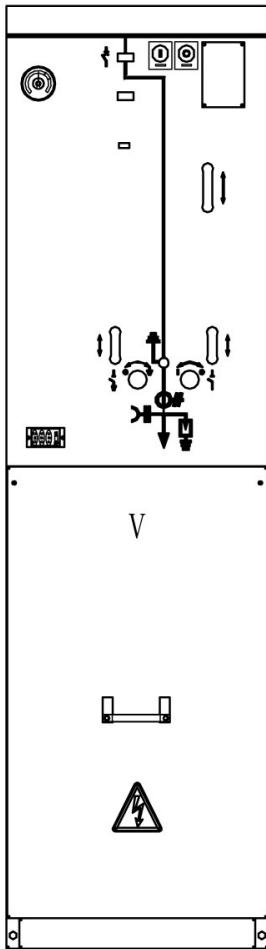
Standard configuration and characteristic:

- Busbars 630A
- Three position switch-fuse combination with upstream earthing
- switch mechanically linked with downstream earthing switch
- Spring operating mechanism of load break switch
- 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 manometer (only one each SF6 tank)
- Earthing busbar
- Interlock between ES and cable compartment door

Optional features:

- Bushings for connection of external busbars 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 and amperemeter
- Touchable cable termination kits
- Back connection type lightning arrestor
- Key interlock
- Auxiliary contacts
 - Position of LBS 6NO+6NC
 - Position of ES 2NO+2NC
 - Signal from manometer indicator 2NO
 - Fuse blown 1NO
- Secondary device.

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 气压表 (共箱时每个气箱配一只气压表)
- 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
- 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
 - 带信号的气压表 2NO
- 二次装置

Standard configuration and characteristic:

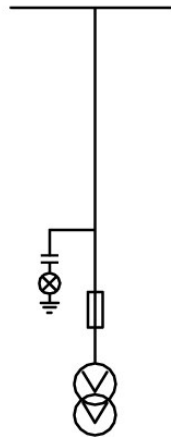
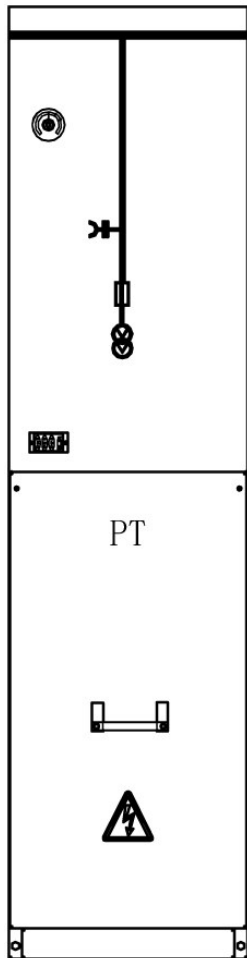
- Busbars 630A
- Vacuum circuit breaker
- Spring operating mechanism for vacuum circuit-breaker
- Three position disconnect/earthing switch
- Operating mechanism of three position disconnect
- VCB and DS,ES position indicator
- Mechanical interlock between VCB and DS
- 630A Cable bushings horizontal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

Optional features:

- Self powered electronic protection relay
- Integrated protection relay
- Two position disconnect
- Bushings for connection of external busbars 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
- Short circuit and earth fault indicator
- Loop current transformer and amperemeter
- Touchable cable termination kits
- Back connection type lightning arrester or double cable connection
- 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 manometer indicator 2NO
- Secondary device

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



标准配置:

- 2只电压互感器及电压表
- 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
- 避雷器
- 24V DC 充电模块及电池 2只 12V,24Ah
- 二次装置

Standard configuration and characteristic:

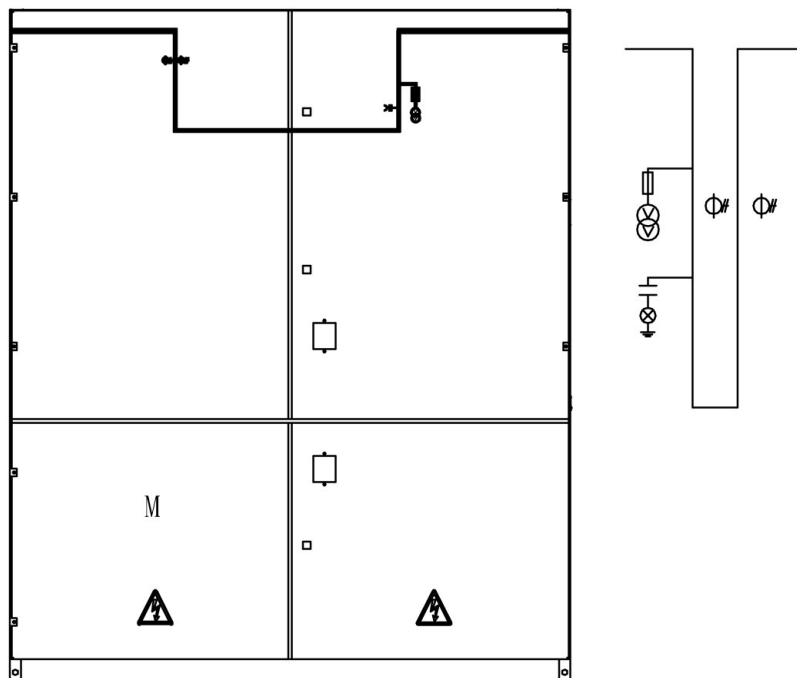
- Two voltage transformer, "VV" connection, and voltage meter
- Fuse for protection of PT
- 35mm² connection cable and cable connector
- Capacitive voltage indicating systems
- Electromagnetic lock
- Earthing busbar

Optional features:

- Voltage transformer 1 ps, "--" connection
- Voltage transformer 3ps, "YY" connection
- Lightning arrester
- 24VDC charge module and two rechargeable batteries,12V,24Ah
- Secondary device

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 2只
- 电压互感器 2只
- 保护电压互感器的高压熔断器
- 指示套管带电的容性带电显示器
- 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
- 计量电表

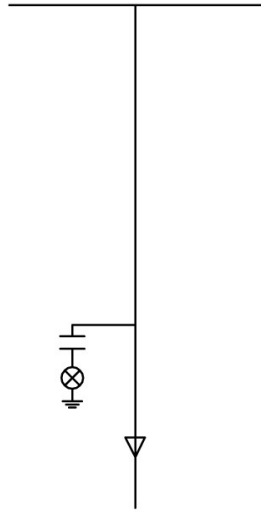
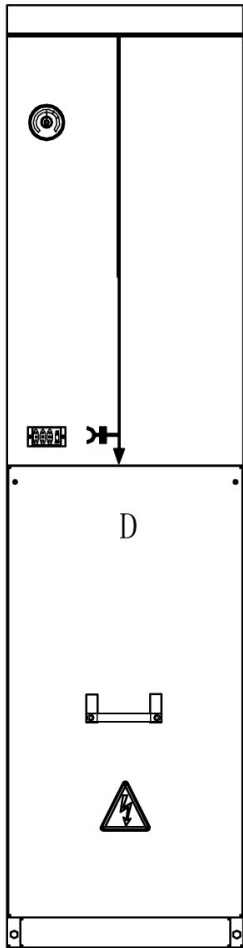
Standard configuration and characteristic:

- Busbars 630A
- Two current transformer.
- Two voltage transformer, "VV" connection
- Fuse for protection of PT
- Capacitive voltage indicating systems
- Electromagnetic lock
- Earthing busbar
- Electricity meter shelve

Optional features:

- Current transformer 3ps
- Voltage transformer 3ps
- Lightning arrester
- Secondary device
- 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 气压表 (共箱时每个气箱配一只气压表)
- 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
- 后接式避雷器或双电缆头
- 二次装置

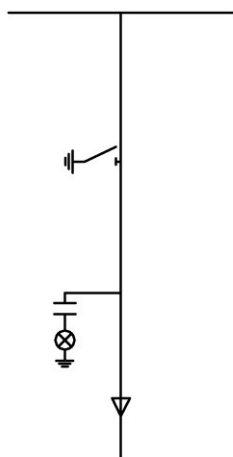
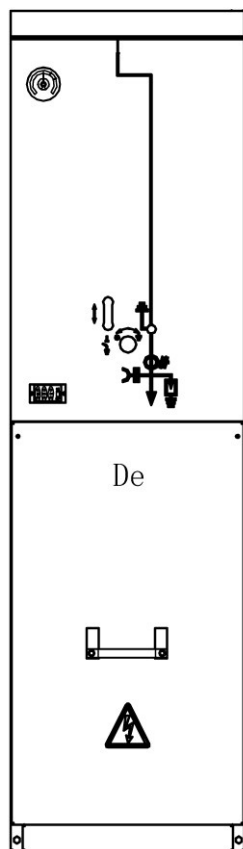
Standard configuration and characteristic:

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

Optional features:

- Bushings for connection of external busbars on top
- Bushings for side extension
- Short circuit and earth fault indicator
- Loop current transformer and amperemeter
- Touchable cable termination kits
- Back connection type lightning arrester or double cable connection
- Secondary device

带接地开关电缆直接进线单元DQS-De Direct cable in with ES unit Unit DQS-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 气压表 (共箱时每个气箱配一只气压表)
- 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
- 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

Standard configuration and characteristic:

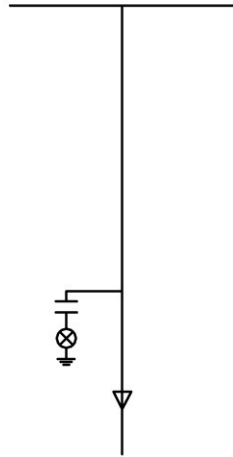
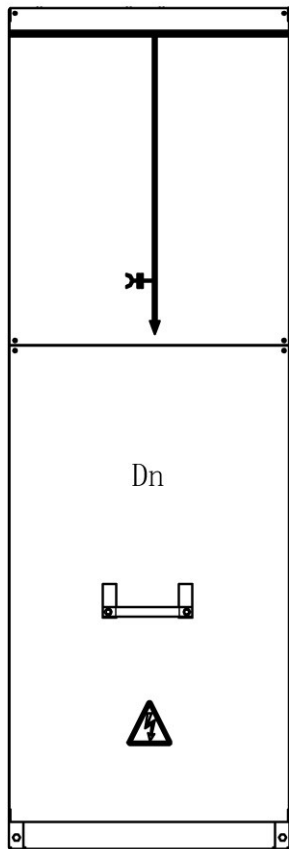
- Busbars 630A
- Earthing switch
- Operating mechanism of earthing switch
- ES position indicator
- Padlocks on faceplates for every switch
- 630A Cable bushings horizontal in front, with integrated capacitor for voltage indication
- Capacitive voltage indicating systems
- SF6 manometer (only one each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

Optional features:

- Bushings for connection of external busbars on top
- Bushings for side extension
- Short circuit and earth fault indicator
- Loop current transformer and amperemeter
- Touchable cable termination kits
- Back connection type lightning arrester or double cable connection
- Auxiliary contacts
- Position of ES 2NO+2NC
- Secondary device

电缆侧面直接进线单元 DQS-Dn Direct cable in from the side Unit DQS-Dn

本柜为空气绝缘单元 This is air insulated unit



标准配置:

- 指示套管带电的容性带电显示器
- 接地母线

可选配置:

- 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
- 后接式避雷器或双电缆头
- 二次装置

Standard configuration and characteristic:

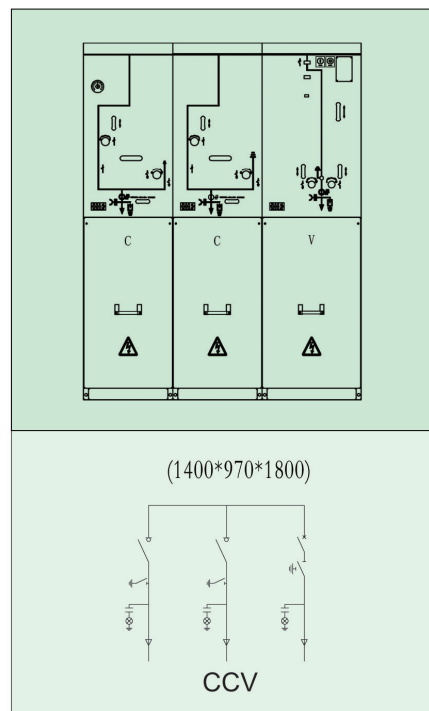
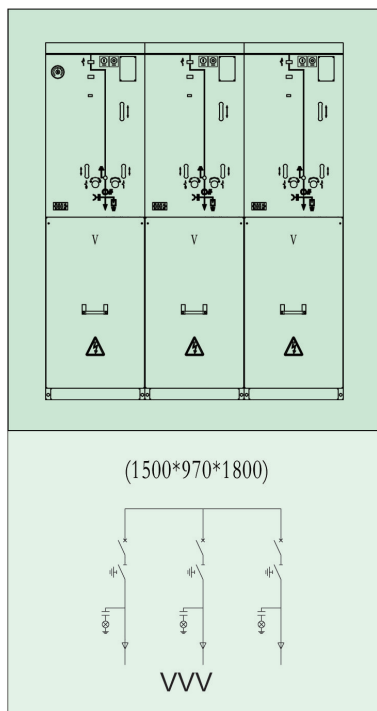
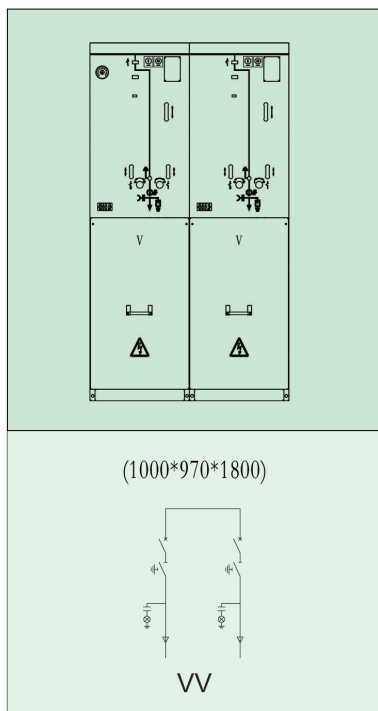
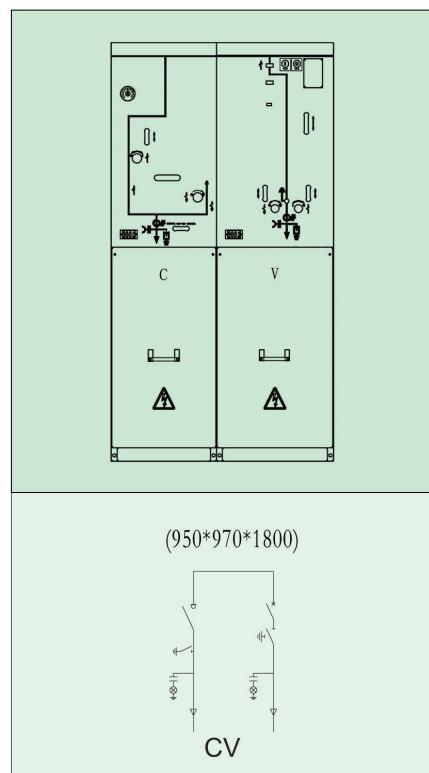
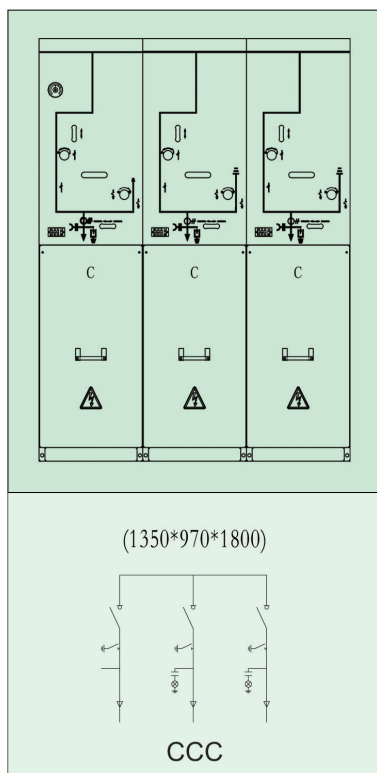
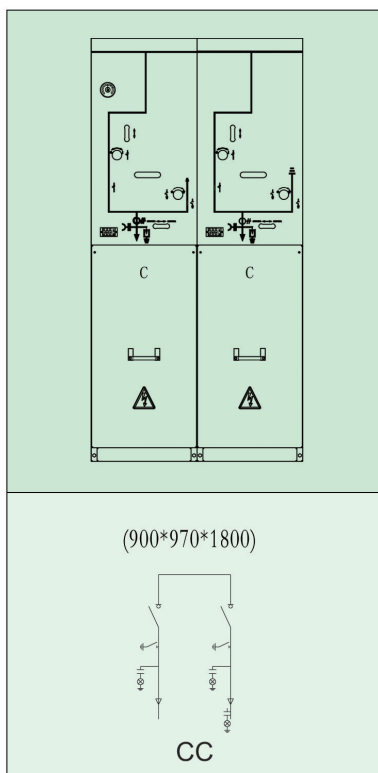
- Capacitive voltage indicating systems
- Earthing busbar

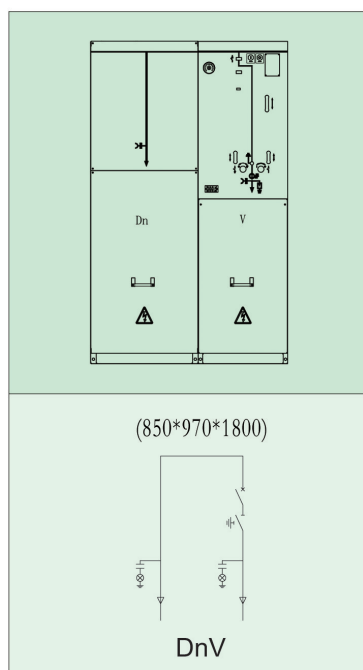
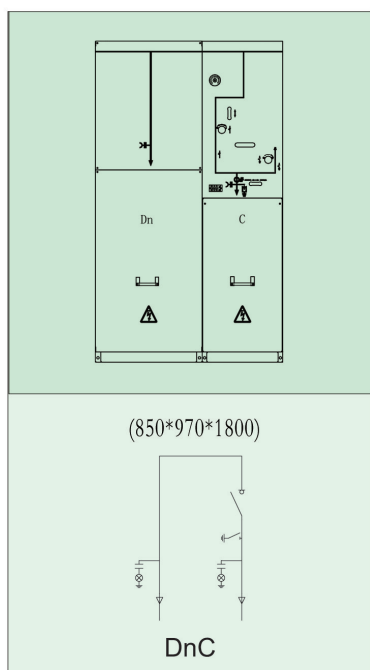
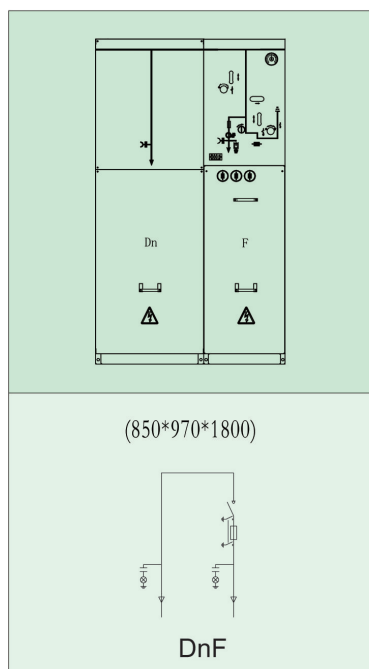
Optional features:

- Short circuit and earth fault indicator
- Loop current transformer and amperemeter
- Touchable cable termination kits
- Back connection type lightning arrester or double cable connection
- Secondary device

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

- DQS-40.5 环网柜一个气箱内可布置最多3个单元,按用户要求组合。 ■ Users of DQS-40.5 RMU can design their own block solutions; one gas tank can contain 3 units. There are 9 standard combinations in block solution,example as below:





注意:

1. 更多的组合请咨询制造商;
2. 也可以选择单元式方案;
3. 可选配高度 400/500mm 低压箱安装更多的二次元件

Note:

1. More combinations , please consult with the manufacture.
2. Modular type is also available;
3. Optional 400/500mm height low voltage compartment to installing more secondary components

扩展方案说明 Introduction of Extension

■ 所有带气箱的独立单元和组合单元均可以灵活扩展,满足不同的设计方案。

■ 外部母线扩展方案命名规则如下:

顶部扩展符号: "+"

侧面扩展符号: "-"

■ All panels are extendible,fullfilling users' requirements.

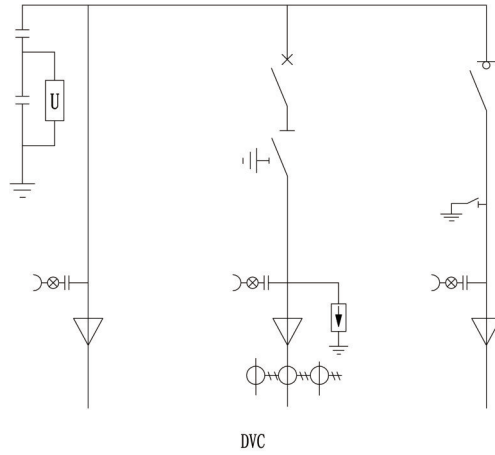
■ External busbar extension solution naming rule as follow:

Top extension sign: "+"

Side extension sign: "-"

典型应用案例 Typical application schemes

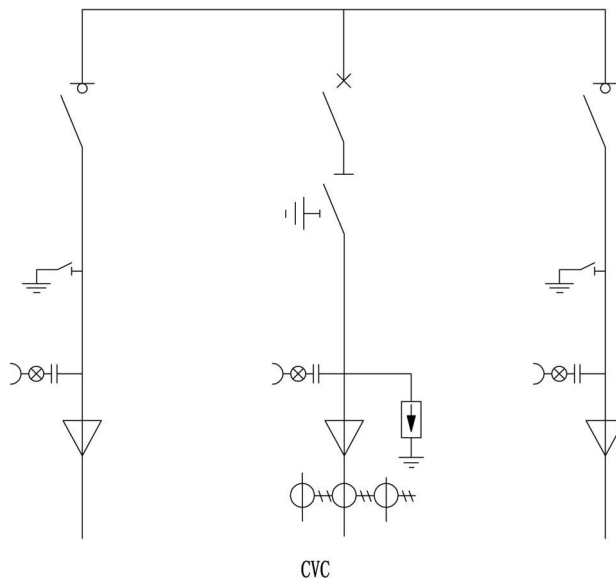
■ 方案1 : DVC
Solution1 : DVC



■ 实施方案 : DVC

- D表示“电缆直接进线单元”
- D Stands for “Direct Cable In Unit ”
- V表示“断路器单元”
- V Stands for “1 circuit breaker combinations”
- C表示“复合开关单元”
- C Stands for “1 Load break switch Unit ”

■ 方案2 : CVC
Solution2 : CVC

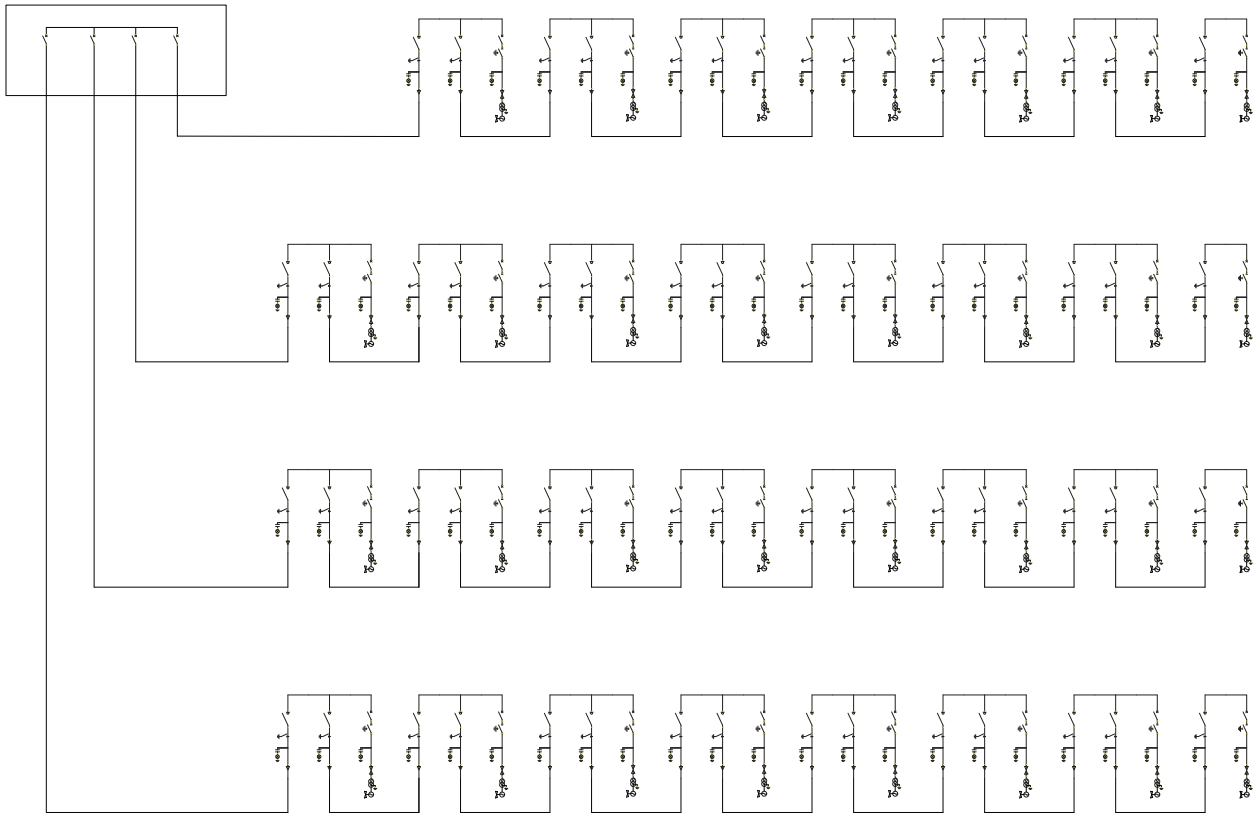


■ 实施方案 : CVC

- V表示“断路器单元”
- V Stands for “1 circuit breaker combinations”
- C表示“复合开关单元”
- C Stands for “1 Load break switch Unit ”

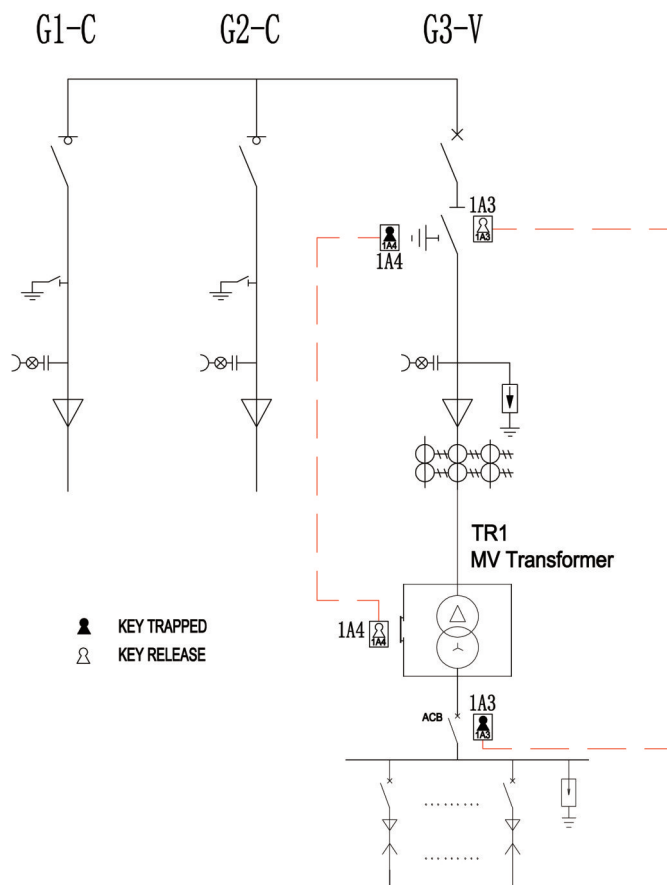
- 方案3：典型风力发电场设计方案
Solution 3: Typical wind farm design;

40.5/110kV 升压站 40.5/110kV step-up substation



- 如环网柜安装在风力发电箱变外部，可以采用共箱组合式方案。如果环网柜安装在风机塔筒内部，则需要采用单元式方案。
DQS-40.5单元式产品尺寸完全满足进入各型风机塔筒内部要求。
If the RMU installed outside box-type substation, combination type can be used.
If the RMU installed inside wind tower tube, unit type should be used. The size of unit type DQS-40.5 series RMU completely satisfied into wind tower tube.

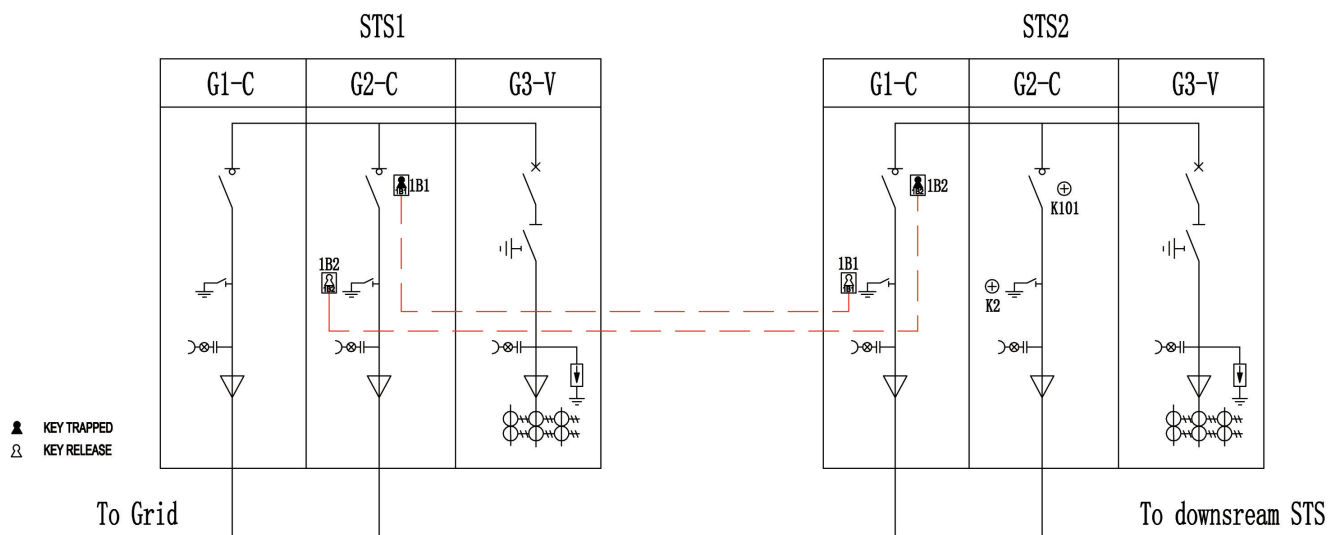
箱变内联锁 The case is interlocked internally



- G3-V 断路器柜中隔离开关操作孔处配置机械锁 1A3，当钥匙插入后，才能解锁隔离开关进行合分操作，仅当隔离开关合闸后，才能拔出钥匙，且当钥匙拔出后，将隔离开关锁定在合闸位置。
- G3-V 断路器柜中接地开关操作孔处配置机械锁 1A4，当钥匙插入后，才能解锁接地开关进行合分操作，仅当接地开关合闸后，才能拔出钥匙，且当钥匙拔出后，将接地开关锁定在合闸位置。
- 如在变压器网门处配置另一把机械锁 1A4，低压断路器侧配置另一把机械锁 1A3。在正常运行时如需维护变压器，应先将低压断路器断开，拔出钥匙 1A3，将钥匙插入 G3-V 断路器柜隔离开关处机械锁 1A3，解锁隔离开关进行分闸，再将接地开关操作至接地位置，拔出钥匙 1A4，将钥匙插入变压器网门处机械锁 1A4，打开网门维护变压器，确保变压器网门打开前，变压器高低压侧断路器均已断开。

- There is a mechanical lock 1A3 at the disconnecting switch operation hole in the G3-V circuit breaker cabinet. Only after the key is inserted, can the disconnecting switch be unlocked for opening and closing operation. Only after the disconnecting switch is closed, can the key be removed.
- A mechanical lock 1A4 is arranged at the ground switch operation hole in the G3-V circuit breaker cabinet. Only after the key is inserted, can the ground switch be unlocked for opening and closing operation. Only after the ground switch is closed, can the key be pulled out.
- If another mechanical lock 1A4 is configured at the transformer mesh door, another mechanical lock 1A3 is configured at the side of the low-voltage circuit breaker. During normal operation, such as maintenance, transformer, should be low voltage circuit breaker broken first, pull out the key 1 a3, insert the key into the G3 - V circuit breaker cabinet isolating switch 1 a3 mechanical lock, unlock break-brake isolating switch, grounding switch operation again to grounding position, pull out the key 1 a4, insert the key into the transformer 1 a4 door mechanical lock, open the door maintenance transformer, Ensure that the circuit breakers on the high and low voltage sides of the transformer are disconnected before the transformer net door is opened.

箱变间联锁 Interlocking between boxes



- STS1中G2-C柜负荷开关操作孔处配置机械锁1B1，当1B1钥匙插入后，转动钥匙将伸出的锁舌缩回，才能解锁负荷开关进行合分操作，仅当负荷开关分闸后，转动钥匙将锁舌完全伸出，才能拔出1B1钥匙，且当1B1钥匙拔出后，转动钥匙将伸出的锁舌缩回，将负荷开关锁定在分闸位置。
- STS2中G1-C柜接地开关操作孔处配置机械锁1B1，当1B1钥匙插入后，转动钥匙将伸出的锁舌缩回，才能解锁接地开关进行合分操作，仅当接地开关分闸后，转动钥匙将锁舌完全伸出，才能拔出1B1钥匙，且当1B1钥匙拔出后，将接地开关锁定在分闸位置。
- 两把机械锁1B1共用一把钥匙(编号1B1)，只要STS1中G2-C柜负荷开关处于合闸位置，就无法将1B1钥匙拔出，这样能将STS2中G1-C柜接地开关锁定在分闸位置。只有先将STS1中G2-C柜负荷开关进行分闸操作，才能拔出钥匙1B1，将负荷开关锁定在分闸位置。然后才能将钥匙1B1插入STS2中G1-C柜接地开关操作孔处机械锁，解锁接地开关进行合分闸操作，且当接地开关处于合闸位置时，钥匙1B1将无法拔出，这样STS1中G2-C柜负荷开关将锁定在分闸位置。
- 如STS2中G1-C柜负荷开关操作孔与STS1中G2-C柜接地开关操作孔处配置另一相同机械锁1B2，这样无论从STS1中的G2-C柜，还是STS2中的G1-C柜，都无法将接地开关合于带电的电缆上。
- Mechanical lock 1B1 is configured at the operation hole of load switch in G2-C cabinet in STS1. After the 1B1 key is inserted, turn the key to retract the extended lock tongue to unlock the load switch for opening and opening operation. Only after the load switch is opened, turn the key to fully extend the lock tongue to remove the 1B1 key. Turn the key to retract the extended lock tongue and lock the load switch in the opening position.
- In STS2, mechanical lock 1B1 is configured at the operation hole of the grounding switch of g1-C cabinet. After the 1B1 key is inserted, turn the key to retract the extended lock tongue to unlock the grounding switch for opening and opening operation. Only after the grounding switch is opened, turn the key to fully extend the lock tongue to remove the 1B1 key. Lock the ground switch in the opening position.
- The two mechanical locks 1B1 share one key (No. 1B1). As long as the load switch of G2-C cabinet in STS1 is in the closing position, the key of 1B1 cannot be pulled out, so that the ground switch of G1-C cabinet in STS2 can be locked in the opening position. Key 1B1 can be pulled out to lock the load switch in the opening position only after opening the load switch in G2-C cabinet in STS1. Then, key 1B1 can be inserted into the mechanical lock at the operation hole of g1-C cabinet ground switch in STS2 to unlock the ground switch for opening and closing operation. When the ground switch is in the closing position, key 1B1 will not be removed, so that the g2-C cabinet load switch in STS1 will be locked in the opening position.
- If another same mechanical lock 1B2 is configured at the operation hole of the g1-C cabinet load switch in STS2 and the ground switch of G2-C cabinet in STS1, the ground switch cannot be connected to the live cable from either G2-C cabinet in STS1 or G1-C cabinet in STS2.
- 除使用上述两锁一钥匙方案，还可使用两把不同的机械锁，将两把机械锁的钥匙串在同一个钥匙圈，也可实现上述功能。
- In addition to the above two locks and one key scheme, two different mechanical locks can also be used, and the keys of the two mechanical locks in the same key ring can also achieve the above functions.

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+65°C
最低-40°C
24h平均温度不超过35°C
 - Ambient temperature : Max +65°C
Min-40°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 enclosure establish special grounding conductor, the grounding conductor which equipped with fixed connection terminals connected to the grounding network;
- 箱体内开关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) =1450*1300*2500 2单元C/F/V/D(2 units C/F/V/D)
- 长*深*高 (L*D*H,mm) =1900*1300*2500 3单元C/F/V/D(3 units C/F/V/D)

■ 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.

DQS 光伏风电户外型产品 DQS Photovoltaic wind power outdoor products



- 可靠性：产品通过整体测试，可确保在高污秽，凝露，高温高湿环境下正常，持久的运行。整体满足C5M盐雾试验要求。
- 高效性：易于安装和运输
尺寸紧凑，重量轻
尺寸与室内开关基本相同
- 技术参数：
最高电压 40.5kV，630AIEC
外观颜色可定制
- 整体测试：内部燃弧等级 25kA/1s
- 最高环境温度：+40°C
- 最低环境温度：-30°C
- 最高应用海拔：2000m
- 新型户外环网柜，可在户外工作环境下正常工作，也可在腐蚀环境，强太阳光辐射区内稳定工作，根据用户需求，该产品可提供2单元，3单元不可扩展的组合方式。
- 可以选择向下和向上两种泄压方式。燃弧等级可以达到25kA/1s。
- The new type of outdoor ring network cabinet can work normally in the outdoor working environment, but also can work stably in the corrosive environment, strong sunlight radiation area, according to user requirements, the product provides 2 units, 3 units cannot be expanded combination mode.
- Two pressure relief modes can be selected, downward and upward, and the arc grade can reach 25kA/1s.
- Reliability: Pass the overall test, the product can ensure normal and lasting operation in high pollution, condensation, high temperature and high humidity environment. It meets the requirements of C5M salt spray test.
- Efficient: easily install and transport
Compact size, light weight
The size of the indoor switch is basically the same
- Technical parameters:
Maximum voltage 40.5kV, 630AIEC
Appearance color can be customized
- Overall test: internal arc rating 25kA/1s
- Maximum ambient temperature: +40°C
- Minimum ambient temperature: -30°C
- Maximum altitude: 2000m

尺寸与重量

柜型 Unit	宽度 Width: mm	深度 Depth: mm	高度 Height: mm	重量 Kg
CV	1145	1155	2170	900
DCV	1595	1155	2170	1200
CCV	1595	1155	2170	1400

外形尺寸及安装 Dimensions and Installation

DQS-40.5 系列 40.5kV 充气环网柜外形尺寸 DQS-40.5 Serie 40.5kV RMU outline diemension

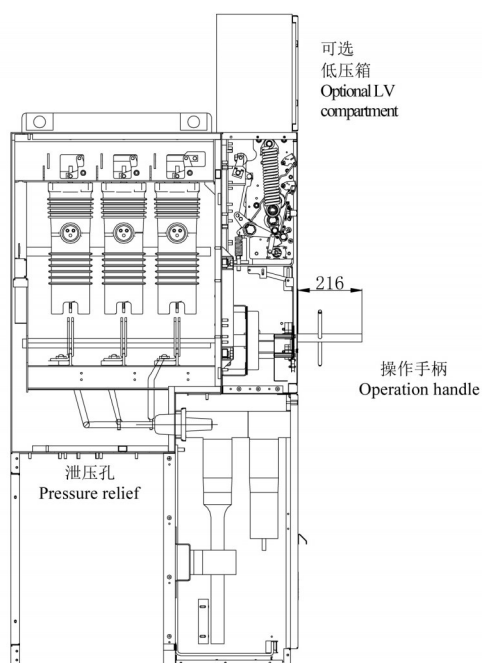
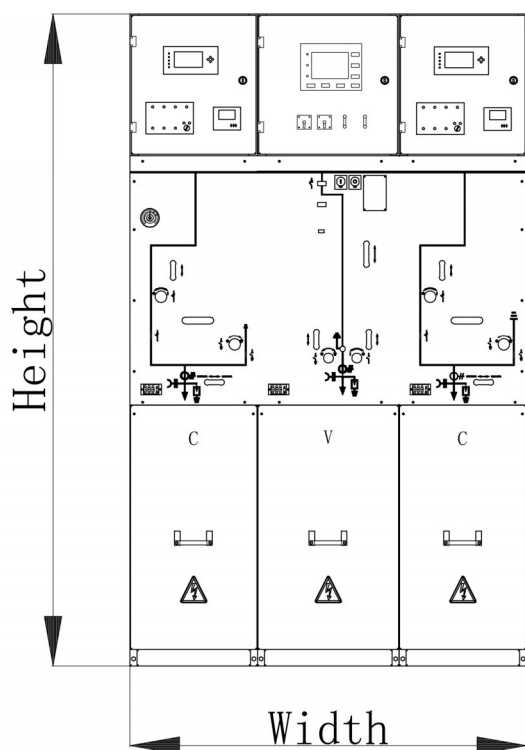
方案① Unit			宽 Width;mm	深 Depth: mm	高② Height: mm
C	F	CPT	450	970	2200/2300
D			450	970	2200/2300
De			500	970	2200/2300
Dn			400/500/600	970	2200/2300
V			500	970	2200/2300
PT			1000	970	2200/2300
M			1000/1400	1400	2200/2300

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 CVC 尺寸，W*D*H=1400*970*2200/
2300mm

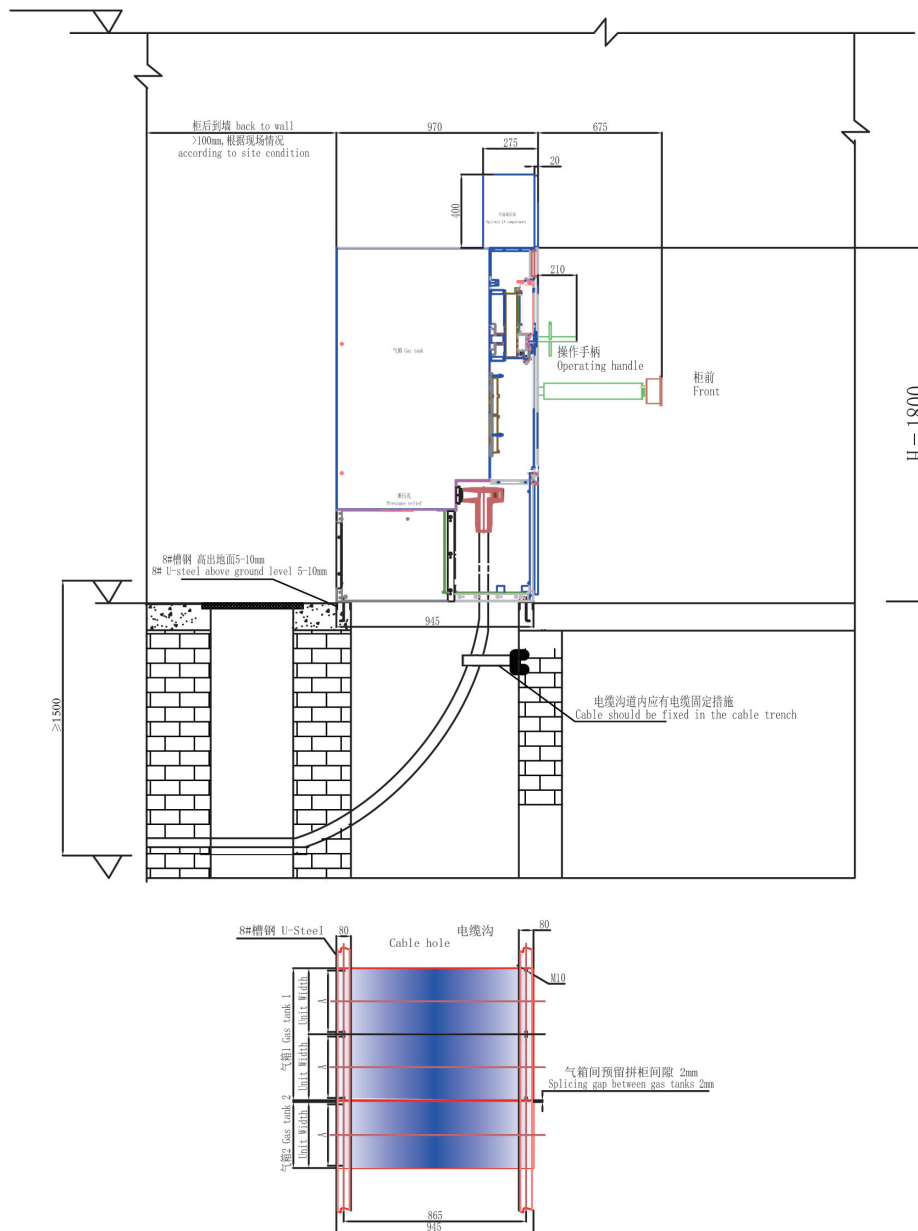
②高度尺寸根据低压室高度；

①The unit dimension are the same both in share gas tank
combination module and separate gas tank module.
For example,share gas tank combination CVC ,
W*D*H=1400*970*2200/2300mm;

②The height size according to the low Voltage compartment;



DQS 系列充气环网柜安装示意图 DQS Serise RMU Installation Diagram



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450/500mm间距槽钢底部焊接一处钩钉加固；
- 945mm为框架底座深度
- A尺寸详见P37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 450/500 mm at the bottom of the U-steel;
- 945mm is the panel frame depth.
- Size "A" can be found in Page 37 , outline dimension.



充气柜技术服务

销售电话：137-7530-9572

技术电话：139-1455-9122



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2022年8月印制

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