



INDUSTRIAL SOLUTION SYSTEMS



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NES-12

抽出式中压开关设备

Withdrawable Medium Voltage Switchgear



纳图电气集团股份有限公司
NATUS ELECTRIC GROUP CO.,LTD.

集团业务 Group Business

集团专注于中低压电力行业的系统集成、EPC工程总包服务及核心产品的研发、生产与销售。在电力设备领域，我们深耕智能电气成套产品、高端电力元器件、先进电能质量治理产品、智能控制仪表与控制系统。基于人工智能与大数据分析的技术积累，我们提供变电站与输电线路的气象灾害预防设备与安全运行综合解决方案。在新技术领域，我们聚焦小区域低空气象高精度预测技术，为低空经济发展提供综合性的产品与服务。



The Group specializes in system integration, EPC turnkey services, and the R&D, production, and sales of core products within the medium and low-voltage power industry. In the field of power equipment, we have deep expertise in intelligent electrical switchgear system, high-end power components, advanced power quality management products, intelligent control instruments, and control systems. Leveraging accumulated expertise in artificial intelligence and big data analytics, we provide comprehensive solutions for meteorological disaster prevention equipment and the safe operation of substations and transmission lines. In the domain of new technologies, we focus on small-area, low-altitude meteorological high-precision prediction technology, offering integrated products and services to support the development of the low-altitude economy.

集团理念 Group Vision

纳图电气集团源自德国，立足中国，服务全球。自1956年成立以来，集团以德国技术为基础，深度融合中国智慧与全球视野，依托强大的中国研发与制造团队，精准响应全球市场需求，为各行业客户提供智慧电力的专业解决方案。集团坚持以客户为中心，致力于创新产品、可靠技术与精益制造，携手全球用户共同构建更智能、高效、可持续的电力能源未来。



Natus Electric Group originates from Germany, is firmly rooted in China, and serves the global market. Since its establishment in 1956, the group has built upon German technology deeply integrating Chinese expertise and a global perspective. Supported by a robust Chinese R&D and manufacturing team, we precisely respond to global market demands, delivering professional intelligent power solutions for clients across various industries. Adhering to a customer-centric approach, the group is committed to innovative products, reliable technology, and lean manufacturing.

Working hand-in-hand with global users to build a smarter, more efficient, and sustainable future for the power and energy sector.



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- 纳图电气集团是德国NATUS公司在亚太地区设立的研发与制造基地, 依托德方核心技术成功研制出NES系列金属铠装移开式开关设备。该设备额定电压3.6-40.5kV, 采用三相交流50Hz单母线系统设计, 通过空气绝缘技术确保运行安全。产品经过包括型式试验、抗震测试及内部电弧故障防护试验在内的多项严苛检测, 在全球电力系统中具有长期稳定运行的成熟表现。
- NES是一种智能型户内金属封闭式中压开关柜系统。该系统不仅搭载了电动底盘车、电动接地刀等智能控制元件, 还可集成智能荧光光纤测温系统、局放在线监测系统及绝缘件失效早期预警系统等一系列先进监测功能。其核心优势在于搭载了新一代开关在线监测分析系统, 能够将所有电气参数、控制与保护信号集成至统一的大数据分析平台, 实现整机电设备的实时监控、故障预警与可视化图表展示, 最终完成对开关柜全生命周期的智能化管理。
- Natus Electric Group serves as the R&D and manufacturing base established by NATUS Germany in the Asia-Pacific region. Leveraging core German technologies, it has successfully developed the NES series of metal-clad withdrawable switch-gear. This equipment operates at rated voltages of 3.6-40.5kV, featuring a three-phase AC 50Hz single-busbar system design. Air insulation technology ensures operational safety. The product has undergone multiple rigorous tests, including type testing, seismic testing, and internal arc fault protection testing, demonstrating proven long-term stable performance in global power systems.
- NES is an intelligent indoor metal-enclosed medium-voltage switchgear system. The system not only incorporates intelligent control components such as motorized Withdrawable Chassis and electric earthing switches, but also integrates a series of advanced monitoring functions including an intelligent fluorescent optical fiber temperature measurement system, partial discharge online monitoring system, and early warning system for insulation component failure. Its core advantage lies in the integration of a next-generation switchgear online monitoring and analysis system. This system consolidates all electrical parameters, control signals, and protection signals into a unified big data analytics platform. It enables real-time monitoring of the entire equipment, fault early warning, and visualization through graphical displays, ultimately achieving intelligent management throughout the switchgear's entire lifecycle.

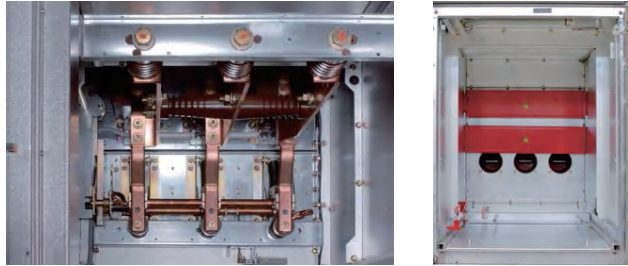


- 模块化设计, 配置极其灵活, 可完全依照客户需求, 可选用任一国际知名品牌的真空断路器;
- 可按程序选择断路器手车推入/移出、断路器分/合闸和接地开关分/合闸的电动操作, 通过多功能保护控制器可实行就地控制或远方控制, 实行远程智能化控制;
- 大电流、高容量: 主线母电流达到5000A, 额定短时耐受电流达到50kA;
- 中置式断路器手车, 有利于母线防潮和提高绝缘水平;
- 断路器手车移动用丝杆推动, 省力、定位准确、同类型手车具有互换性;
- 可实现双母线、三母线系统;
- 开关柜断路器和接地开关均可实现关门操作, 靠墙安装型产品可以全部实现柜前检修;
- 开关柜具有可靠的联锁装置, 完全满足“五防”要求, 为操作人员与设备提供可靠的安全性保护;
- 接地开关具有快速关合能力, 检修接地方便, 保证人身安全;
- 通过燃弧与抗震8级试验;
- 柜内的主要电器元件具有独立的隔室, 全部采用金属隔板, 间隔为PM级, 全部满足IEC、GB、DL等标准, 机械寿命为M2级, 电寿命为E2水平, 通过了800A开合电容器组试验;
- 开关柜的强度通过0.5秒内部电弧故障试验, 外防护达到IP41。
- Modular design, configuration is extremely flexible, can be completely in accordance with customer needs, can choose any internationally renowned brand of vacuum circuit ;
- The electric operation of circuit breaker trolley pushing in/removing out, circuit breaker opening/closing and earthing switch opening/closing can be selected according to the procedure, and the remote intelligent control can be implemented through the multifunctional protection controller with local control or remote control;
- High Current, High Capacity: Main busbar current reaches 4000A, rated short-time withstand current reaches 50kA;
- Center-mounted circuit breaker handcart for busbar moisture protection and improved insulation levels;
- Circuit breaker trolley moving with a silk rod to promote, labor-saving, accurate positioning, the same type of trolley has interchangeability;
- Double and triple busbar systems can be realized;
- Switchgear circuit breakers and grounding switches can all be operated with the door closed, and the wall-mounted type products can all realize pre-cabinet maintenance;
- The switchgear is equipped with reliable interlocking devices, which fully meets the requirements of "five precautions" and provides reliable safety protection for operators and equipment;pre-cabinet maintenance;
- The grounding switch has a quick closing ability, and it is easy to check and repair the grounding. It is easy to repair the grounding and ensure personal safety;
- Passed arc-firing and seismic class 8 tests;
- The main electrical components in the cabinet have independent compartments, all of which are metal partitions with PM level spacing, all of which meet the standards of IEC, GB, DL, etc. The mechanical life is at M2 level, and the electrical life is at E2 level, and it has passed the test of 800A open and close capacitor bank;
- The strength of the switchgear passes the 0.5 second internal arc fault test and the external protection reaches IP41.

NATUS开系统 - 安全和多功能:

NATUS switching systems - safe and Multifunctional:

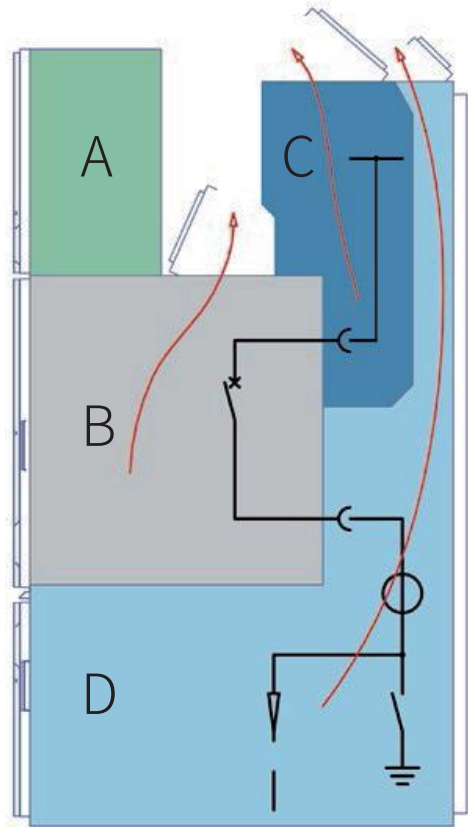
- 通过型式试验、燃弧试验和地震烈度试验
- 金属封闭和空气绝缘, 单, 双, 三母线系统
- Passed type test, arc-firing test and seismic intensity test
- Metal-enclosed and air-insulated, Single, double and triple busbar systems



开关柜的外形尺寸、泄压通道及4个模块的分布如图:

The outline size, pressure relief channel and distribution of 4 modules of the switch cabinet are shown as follows:

- A、仪表室模块 Instrumentation Room Module
- B、断路器室模块 Breaker room module
- C、母线室模块 Busbar Room Module
- D、电缆室模块 Cable Room Module



	单位 UNIT	额定电流 Rated current ≤1250A	额定电流 rated current ≥1250A
外形尺寸 Overall dimensions (WDXH)	mm	800x1500x2360	1000x1500x2360
重量 Weights	kg	≈900	≈1200

* 根据客户需求,可提供额定电流≤1250A,宽度为650mm的开关柜。

According to the customer's requirements, we can provide the rated current≤1250A, width is650mm width switchgear

NES 开关柜结构

NES Switchgear Construction

A、仪表室模块 (Instrumentation Room Module)

- 仪表室安装一些必要的二次元件, 如各类继电器、仪表、信号指示、操作开关等, 其顶部可安装小母线, 便于施工并用金属盖板封住。
- The instrument room is equipped with some necessary secondary components, such as various relays, meters, signal indications, operating switches, etc., and a small bus bar can be installed on the top to facilitate construction and be sealed with a metal cover plate.

B、断路器室模块(Breaker room module)

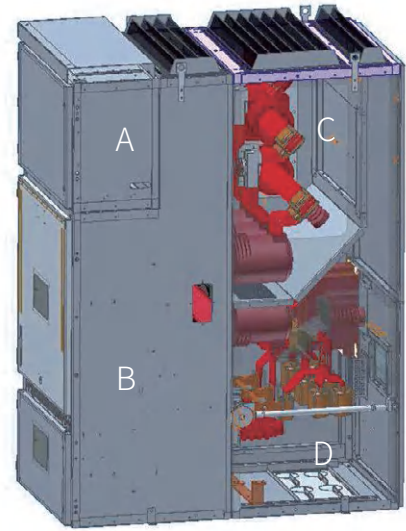
- 断路器室, 配有运转小车平台。断路器室内安装了固定导轨, 供手车实现在柜内隔离/试验位置和工作位置间的运动和关联锁。在一次静触头的前端装有金属活门机构, 手车移到试验位置时, 活门通过机械联动自动关闭, 所有的操作均在活门关闭的情况下进行。
- The circuit breaker compartment is equipped with a moving trolley platform. Fixed rails are installed within the compartment to enable the movement of the drawout unit between the isolation/test position and the working position within the cabinet, along with associated interlocks. A metal shutter mechanism is fitted at the front end of the primary static contacts. When the drawout unit is moved to the test position, the shutter automatically closes via mechanical linkage. All operations are performed with the shutter closed.

C、母线室模块(Busbar Room Module)

- 柜内母线通过高强度的螺栓连接与分支母线固定。相邻柜母线室之间采用金属隔板和绝缘套管隔离, 能有效防止事故蔓延。全部母线可以用热缩绝缘套管覆盖或环氧喷涂, 母线搭接处也可以用绝缘罩覆盖, 使母线室达到全封闭。
- The cabinet bus bar is fixed with branch bus bar by high strength bolt connection. Metal partition and insulating sleeve are used to isolate the bus rooms of adjacent cabinets, which can effectively prevent the spread of accidents. All the busbars can be covered with heat shrink insulation bushing or epoxy spraying, and the busbar overlap can also be covered with insulation cover, so that the busbar room can be completely closed.

D、电缆室模块 (Cable Room Module)

- 电缆室可装电流互感器、接地开关及避雷器, 动力电缆也在此室内连接。在接地开关处于合闸状态时, 才可打开后门, 门板上配有照明装置并开有视窗, 可以随时看到电缆头和接地开关的状态, 可预防误入带电间隔的机械与电气连锁。
- The cable room can be equipped with current transformers, ground switches and lightning arresters, and power cables are also connected in this room. When the grounding switch is in the closing state, the back door can be opened, and the door panel is equipped with lighting devices and open Windows, you can see the status of the cable head and the grounding switch at any time, which can prevent the mechanical and electrical chain of the charging interval.

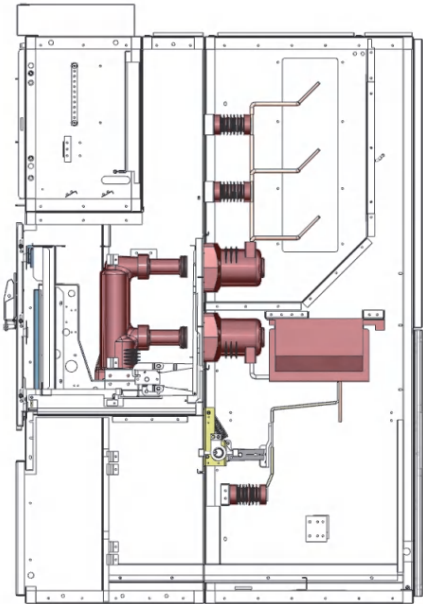


NES 开关柜联锁:
NES Switchgear Interlock:

开关柜设计了一系列联锁防止操作人员的误操作:
The switchgear is designed with a series of interlocks to prevent operator error:

- 仅当断路器手车处于试验或工作位置时, 才能对断路器进行合分闸操作; 断路器处于合闸状态时, 手车无法移动。可有效防止带负荷误推/拉断路器手车。
- 仅当接地开关处在分闸位置时, 才能将断路器手车从隔离/试验位置移至工作位置。可有效防止接地开关处于闭合位置时关合断路器。
- 仅当断路器手车处于隔离/试验位置时, 接地开关才能进行合闸操作。可有效防止带电误合接地开关。
- 当断路器手车在试验或工作位置且没有控制/保护电压时, 仅能手动分闸, 在不进行手动储能的情况下, 不能合闸。
- 手车在工作位置时, 二次插头被锁定不能解除。
- 手车操作孔挂锁机构可以挂锁用来防止误操作手车。

- Only when the breaker trolley is in the test or working position, it can close and separate the breaker; when the breaker is in the closing state, the trolley can not be moved. It can effectively prevent mistakenly pushing/pulling the breaker trolley with load.
- The circuit breaker trolley can only be moved from the isolation/test position to the operating position when the earth switch is in the open position. Effectively prevents the circuit breaker from being switched off when the earth switch is in the closed position.
- The grounding switch can only be closed when the circuit breaker trolley is in the isolation/test position. Effectively prevents inadvertent closing of the grounding switch while energized.
- When the circuit breaker handcart is in the test or working position and there is no control/protection voltage, it can only be opened manually and cannot be closed without manual energy storage.
- When the trolley is in the working position, the secondary plug is locked and cannot be released.
- The trolley operation hole padlock mechanism can be padlocked to prevent misuse of the trolley.



开关柜的一些可选配联锁:
Switch cabinet optional interlock:

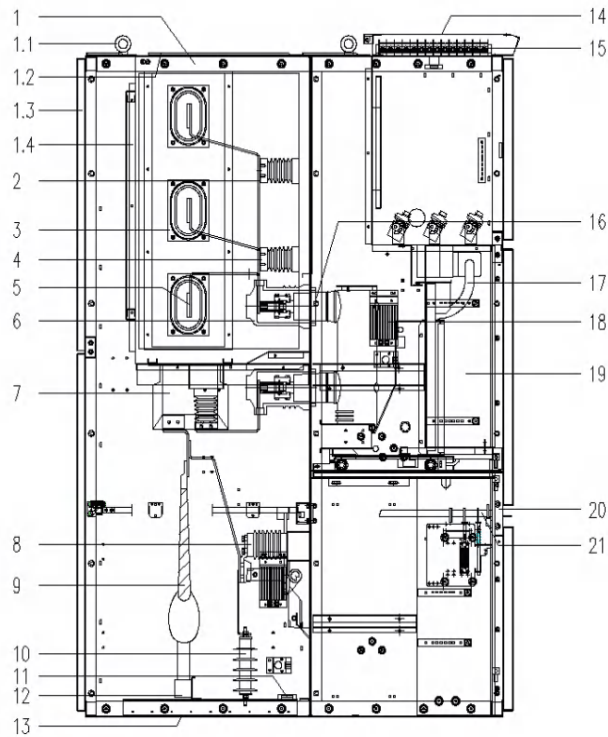
- 手车室门不关闭无法操作手车; 手车在工作位置时, 手车室门无法被打开。
- 手车室门可以增加紧急分闸装置用来紧急分闸断路器。
- 接地开关操作孔可以增加挂锁装置用来防止误操作接地开关。
- The handcart cannot be operated without the handcart compartment door being closed; the handcart compartment door cannot be opened when the handcart is in the working position.
- Emergency breakers can be added to the door of the trolley compartment to break the circuit breakers in case of emergency.
- A padlock can be added to the ground switch operator hole to prevent inadvertent operation of the ground switch.

开关柜维护及指导:
Switchgear maintenance and guidance:

故障描述 Fault Description	故障描述 Fault description	故障描述 Fault description
断路器拒合 Circuit breaker fails to close	断路器拒分 Breaker rejection	储能问题 Breaker rejection
解决措施 Solution measure	解决措施 Solution measure	解决措施 Solution measure
断路器未储能 Circuit breaker not stored 闭锁线圈未得电 The blocking coil is not powered 闭锁线圈烧坏 The lock coil is burned out 闭锁线圈整流桥烧坏 The blocking coil rectifier bridge is burned out 合闸线圈未得电或烧 The dosing coil is not electrically charged or burned 断路器二次控制回路接线 The circuit breaker is connected to the secondary control loop	二次控制回路接线松动 The secondary control loop cable is loose 分闸电压过低 The opening voltage is too low 分闸线圈断线、烧坏 The switching coil is broken and burned out 分闸回路整流桥(V2)烧坏 The opening circuit rectifer bnidge (V2) is burned out	手动可以储能、电动不能储能 Manual can store energy,electric can not store energy 储能回路辅助开关S1烧损 Energystorage circuit auxiliary switch S1 is damaged 储能电机烧损 Energy storage motor burned out 储能完成后电机不停转 The motor does not stop running after the energy storage is completed 辅助开关S1切换不到位 The auxiliary switch S1 is not switched properly 储能辅助开关的连杆与机构脱扣能 Connecting rod and mechanism tripping energy of energy storage auxiliary switch

柜体结构

NES structure



1外壳	Shell
1.1吊环	Hanging rings
1.2泄压盖板	Pressure relief plate
1.3后门	Back door
1.4母线隔室后封板	Busduct Compartment Back Plate
2分支母线	Branch bus
3母线绝缘套管	Busbar insulation bushing
4绝缘子	Insulator
5主母线	Main busbar
6一次静触头盒	Primary Static Contact Chamber
7电流互感器	Current transformer
8接地开关	Ground switch
9电缆	Cable
10避雷器	Lightning arrester
11接地主母线	Ground the main bus
12电缆夹	Cable clamp
13电缆盖板	Cable cover
14小母线顶盖板	Small busbar top cover
15小母线端子	Small bus terminal
16活门	Shutter
17二次插头	Secondary plug
18加热器	Heater
19断路器(或FC)手车	Breaker wagon
20可抽出式水平隔板	Removable horizontal partition
21接地开关操作机构	Grounding Switch Operating Mechanism

- 模块化结构设计
- 安全可靠的联锁机构
- 可方便实现远程智能化操作

- Modular structure design
- Safe and reliable interlocking mechanism
- Remote intelligent operation can be easily realised

NES开关设备 - 行业认可:

NES Switchgear - Industry Recognition:

- 精湛的设计技术
- 长使用周期、免维护
- 低维护周期
- Advanced Design Technology
- Long service life, maintenance-free
- Low maintenance cycle

NATUS开关系统 - 最佳客户服务:

NATUS Switching Systems - Best Customer Service:

- 优质团队全程为您服务
- 从项目设计开始一直到调试结束
- Quality team at your service
- From the beginning of project design until the end of commissioning



- NES 为铠装移开式金属封闭结构, 由柜体和中置式手车。柜体分成断路器室、母线室、电缆室和仪表室。方案多样化。外壳防护等级为IP41。各隔室间以及断路器室门打开时防护等级为IP2X。
- 外壳及隔板是选用优质敷铝锌板经高精度数控机床加工和双重折弯后, 用抽芯钢铆钉、拉铆螺母和高强度螺栓联接而成, 尺寸精确, 结构紧凑、牢固。开关柜的门板面漆采用静电喷涂工艺, 表面抗冲击且造型美观, 具有很强的抗腐蚀与抗氧化作用。
- 开关柜的正面板上、中、下三部分, 上部为控制及保护部分, 中部为开关部分, 仪表及保护继电器、控制开关、按钮等均嵌装于控制部分的门上, 中, 下部面板均设有观察窗且装有防爆门螺栓, 通过了0.5秒的内部故障试验。
- 主要电气元件具有独立的隔室, 隔室均为模块化设计, 分为仪表室模块、电缆室模块和母线室模块, 模块与模块之间用接地的金属板分隔, 开关柜外壳顶部有泄压板。一端采用塑料螺栓固定, 当开关柜内部压力过大时, 塑料螺栓断裂, 泄压板被打开。
- The NES is an armoured, removable, metal-enclosed structure consisting of a cabinet and a centre-mounted trolley. The cabinet is divided into circuit breaker compartment, busbar compartment, cable compartment and instrumentation compartment. The programme is diversified. The enclosure protection class is IP41, and the protection class is IP2X between the compartments and when the door of the breaker compartment is open.
- The shell and partition board are made of high-quality aluminum-zinc plate processed by high-precision CNC machine tool and double bending, and connected with core-drawn steel rivets, riveted nuts and high-strength bolts. The size is accurate, the structure is compact and firm. The surface paint of the door panel of the switch cabinet adopts the electrostatic spraying process, the surface is anti-impact and beautiful in shape, and has strong anti-corrosion and anti-oxidation effects.
- The front panel of the switch cabinet is divided into three parts: upper, middle and lower, the upper part is the control and protection part, the middle part is the switch part, the instrument and protection relay, control switch, button, etc. are embedded in the door of the control part, the middle and lower panels are equipped with observation Windows and explosion-proof door bolts, and have passed the internal fault test of 0.5 seconds.
- The main electrical components have independent compartments, compartments are modular design, divided into instrument room module, cable room module and bus room module, modules and modules are separated by a grounded metal plate, the top of the switch cabinet housing with a pressure relief plate. One end is fixed with a plastic bolt. When the internal pressure of the switch cabinet is too large, the plastic bolt breaks and the pressure relief plate is opened.

应用领域Application



发电厂
Power Plant



变电站
Electrical Substation



工矿企业
Industrial and Mining Enterprises



机场
Airport



铁路
Railway



化工和石化行业
Chemical&Petrochemical Industry



冶金
Metallurgy



地铁
Subway



高层建筑
High-rise Building

技术参数Technical Specifications

NATUS

INDUSTRIAL SOLUTION SYSTEMS

名称 TITLE		名称 UNIT	配用NVT型号的真空断路器 Fitted with NVT type vacuum circuit breakers	
额定电压 Rated voltage		kV	12	
额定绝缘水平 Insulation level	雷电冲击耐受电压 Lightning Impulse	kV	(相间、相对地)75、(断口)85 (Intermittently,relatively)75、(break)85	
	1min工频耐受电压 1min frequency withstand	kV	(相间、相对地)42、(断口)48 (Intemittently,relatively)42、(break)48	
额定频率 Rated frequency		Hz	50	
额定电流 Rated current		A	630、1250	1600、2000、2500、3150、4000、5000
额定短路开断电流 Rated short-circuit breaking current		kA	25、31.5、40	31.5、40、50
4s额定短时耐受电流 4s rated short-time withstand current			25、31.5、40	31.5、40、50
额定峰值耐受电流 Rated peak withstand current			63、80、100	80、100、125
额定短路关合电流 Rated short-circuit closing current			63、80、100	80、100、125
额定操作顺序 Rated sequence of operation			O-0.3s-CO-180s-CO(40,50kA:O-180s-CO-180s-CO)	
额定热稳定电流 Rated Thermal Stability Current		kA	25、31.5、40、50	
相间中心距 Interphase center distance		mm	210	275
额定短路电流开断次数 Rated short-circuit current breaking		次	50	30、20
真空断路器机械寿命 Mechanical life of vacuum circuit		次	30000(10000)	
接地开关机械寿命 Grounding switch mechanical life		次	3000	
分、合闸线圈额定操作电压 Rated operating voltage of opening and cbs		V	AC/DC 110V/220V	
储能电机额定操作电压 Rated operating voltage of energy		V	AC/DC 110V/220V	
储能时间 Energy storage time motor		S	≤15s	
外壳防护等级 Shell protection grade			IP4X	

*如需选择其它真空断路器, 请与制造商联系。
**采用强风制冷方式。

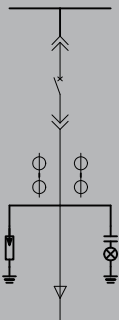
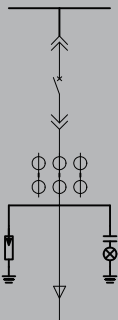
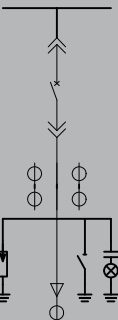
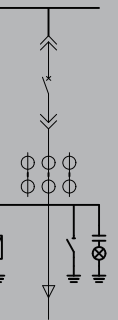
For other vacuum circuit breaker options, contact the manufacturer.
Forced air cooling is used.

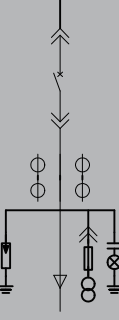
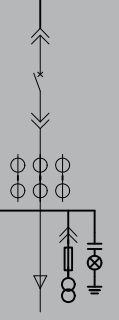
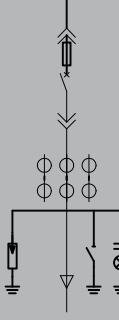
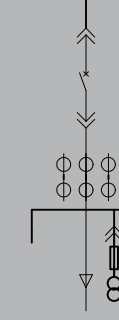
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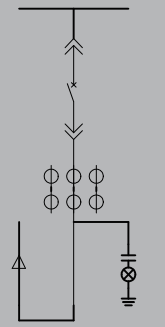
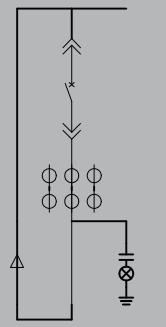
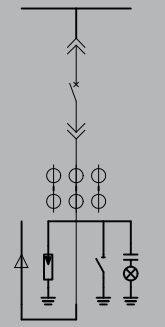
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技术参数 Technical Specifications		NATUS INDUSTRIAL SOLUTION SYSTEMS		设备方案 Equipment Solution		NATUS INDUSTRIAL SOLUTION SYSTEMS	
执行标准: Applicable Standards:							
■ GB/T 3906 《3.6kV~40.5kV交流金属封闭开关设备和控制设备》 ■ GB/T 11022 《高压交流开关设备和控制设备标准的共用技术要求》 ■ DL/T 404 《3.6kV~40.5kV交流金属封闭开关设备和控制设备》 ■ IEC60298:1990 《额定电压1kV以上52kV以下交流金属封闭开关设备和控制设备》		● GB/T 3906 3.6kV~40.5kV AC metal-enclosed switchgear and control ● GB/T 11022 Shared Technical Requirements for High Voltage AC Switch- gear and Control Equipment Standards ● DL/T 404 3.6kV~40.5kV AC Metal-enclosed Switchgear and Control Equipment. ● IEC60298:1990 AC metal enclosed switchgear and control equipment with rated voltages					
运行环境: Operating environment:							
■ 环境温度: 上限+40℃, 下限-15℃ (允许在-30℃时储运); ■ 海拔≤1000m (海拔高度超过1000m时与制造商协商); ■ 日平均相对湿度不大于95%, 月平均相对湿度不大于90%; ■ 地震烈度不超过8度; ■ 饱和蒸汽压: 日平均不大于2.2kPa, 月平均不大于1.8kPa; ■ 无火灾、爆炸危险、严重污秽、化学腐蚀及剧烈震动场所;		● Ambient temperature: Upper limit +40℃, lower limit -15℃ (storage and transportation at -30℃ is allowed); ● Altitude ≤1000m (Consult with the manufacturer if the altitude exceeds 1000m); ● The average daily relative humidity is not greater than 95% and the average monthly relative humidity is not greater than 90%; ● Seismic intensity does not exceed 8 degrees; ● Saturated vapor pressure: daily average not more than 2.2kPa, monthly average not more than 1.8kPa; ● No fire, explosion danger, serious filth, chemical corrosion and violent vibration places.					
注: 如超出以上使用条件, 请用户与我们协商解决。 Note: If the above conditions of use are exceeded, users are requested to negotiate with us to solve the problem.							

方案代号 Solution Code		01	02	03	04
主接线方案 Main Wiring Solution					
主要元器件 Main Meta Instruments Components	真空断路器 vacuum interrupter	1	1	1	1
	电流互感器 current transformer	2	3	2	3
	电压互感器 voltage transformer				
	避雷器 cable connector				
	接地开关 grounding switch			1	1
	熔断器 fuse				
用途 use		电缆进出线 Cable inlet and outlet			
外形尺寸 Overall dimensions(mm)		800(1000)×1500×2360			

方案代号 Solution Code		05	06	07	08
主接线方案 Main Wiring Solution					
主要元器件 Main Meta Instruments Components	真空断路器 vacuum interrupter	1	1	1	1
	电流互感器 current transformer	2	3	2	3
	电压互感器 voltage transformer				
	避雷器 cable connector	3个或1组 3 or 1 group	3个或1组 3 or 2 group	3个或1组 3 or 3 group	3个或1组 3 or 3 group
	接地开关 grounding switch			1	1
	熔断器 fuse				
用途 use		电缆进出线 Cable inlet and outlet			
外形尺寸 Overall dimensions(mm)		800(1000)×1500×2360			

方案代号 Solution Code		09	10	11	12
主接线方案 Main Wiring Solution					
主要元器件 Main Meta Instruments Components	真空断路器 vacuum interrupter	1	1	接触器-熔断器组合电器 Contactor-fuse combinations	
	电流互感器 current transformer	2	3	3	3
	电压互感器 voltage transformer	2	2		2
	避雷器 cable connector	3个或1组 3 or 1 group	3个或1组 3 or 2 group	3个或1组 3 or 3 group	3个或1组 3 or 3 group
	接地开关 grounding switch			1	
	熔断器 fuse	3	3		3
用途 use		电缆进出线 Cable inlet and outlet			
外形尺寸 Overall dimensions(mm)		800(1000)×1500×2360			

方案代号 Solution Code		13	14	15
主接线方案 Main Wiring Solution				
主要元器件 Main Meta Instruments Components	真空断路器 vacuum interrupter	1	1	1
	电流互感器 current transformer	3	3	3
	电压互感器 voltage transformer			
	避雷器 cable connector			3个或1组 3 or 3 group
	接地开关 grounding switch			1
	熔断器 fuse			
用途 use		架空进出线 Overhead access lines		
外形尺寸 Overall dimensions(mm)		800(1000) × 1500 × 2360		



PRECISION IN DETAIL