



INDUSTRIAL SOLUTION SYSTEMS



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NXTs-40.5

C-GIS Gas Insulated Switchgear



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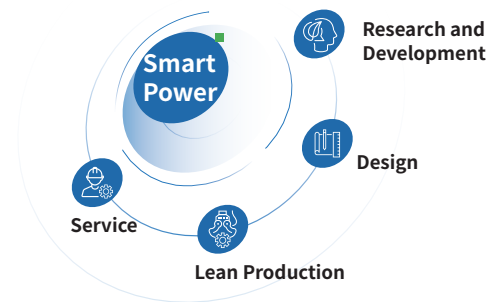
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NATUS ELECTRIC GROUP CO.,LTD.

Group Business



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.

Group Vision



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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The NXTs-40.5 SF6 Gas-Insulated (C-GIS) Compact Metal-Enclosed Switchgear adopts a three-phase common-tank structure and modular design. It consists of independent compartments including the circuit breaker gas tank compartment (equipped with busbars and disconnectors), mechanism compartment, cable compartment, and instrument compartment. Among these, the circuit breaker and disconnector can be separate and independent hermetic gas compartments filled with SF6 gas.

The switchgear is an organic combination of power distribution equipment and control equipment, featuring advanced technology, stable performance, reasonable structure, a user-friendly operation interface, and high safety and reliability. The product has independent intellectual property rights and has obtained a number of invention patents. It is widely used in new energy power generation, energy storage, papermaking, metallurgy, chemical industry and other sectors.

【 Normal Operating Environmental Conditions 】

- Maximum ambient temperature: +45°C ;
- Minimum ambient temperature: -25°C ;
- Altitude: 5000 meters ;
- Relative air humidity: up to 90% (at +25°C) ;
- Seismic intensity: not exceeding Degree 7 ;
- The installation site shall be free from fire hazards, explosion hazards, chemical corrosion, and severe vibrations;
- Note: If the altitude exceeds 2000 meters, please consult with the manufacturer ;

【 Color Standards 】

- Cabinet body: RAL7035 ;
- Operation panel: RAL7035 ;
- Customization available ;

The NXTs-40.5 switchgear is an indoor metal-enclosed, metal-clad, single-busbar switchgear that has passed type tests and is factory-assembled.

- Rated voltage: 40.5kV;
- Maximum feeder current: up to 3150A;
- Maximum busbar current: up to 31500A.

【 Quality and Environmental Protection 】

The energy, quality, and environmental management systems comply with ISO 9001, ISO 14001, and ISO 50001 standards.

【 Personal Safety 】

- Primary components are fully gas-sealed in stainless steel enclosures, allowing for safe touch;
- Cable glands are only accessible when the feeder is earthed.
- Operation is only possible when the cabinet door is closed.
- Logic and mechanical interlocking systems are implemented.
- Mechanical switch position indicators are provided on the mimic diagram, integrated with the panel mimic diagram.
- A capacitive voltage detection system is used to verify safe isolation from the power supply.
- Feeder earthing is achieved using a high-speed earthing switch.

【 Modular Design 】

Unit cabinets can be flexibly combined and expanded without on-site gas-related operations;

Modular gas-insulated switchgear structure allows selection of appropriate switch configurations based on specific requirements, ensuring reliable and cost-effective operation of switchgear equipment.

【 Small Space Occupation 】

The cabinet occupies a small footprint, saving 90% to 150% of floor space per unit compared to traditional air-insulated switchgear.



【 Technology】

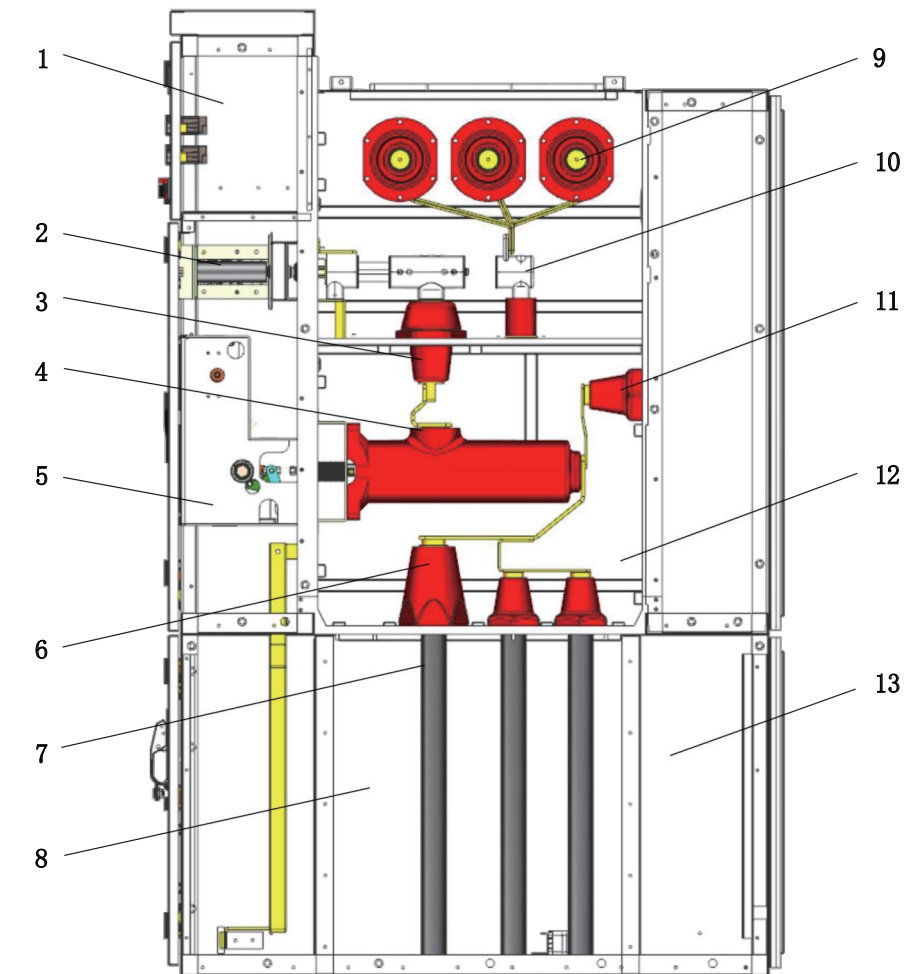
- Three-phase main circuit with metal enclosure, where primary components are completely sealed and unaffected by external environments (such as dirt, moisture, and small animals) ;
- Modular air tank structure allows selection of suitable switch configuration schemes based on specific needs, ensuring reliable and economical operation of the switchgear;
- Standardized and modular cabinet structure enables convenient and flexible combination;
- The cabinet occupies a small area, saving 90% to 150% of the floor space per unit compared with traditional air-insulated switchgear;
- The primary circuit is truly maintenance-free. The high-voltage circuit adopts SF6 gas sealing, which is not affected by the external environment;
- The vacuum interrupter scheme is flexible, supporting both solid-sealed pole technology and insulated cylinder assembly design;

【 Reliability】

- Passed the full range of type tests and factory acceptance tests;
- Manufactured with numerical control equipment;
- With many years of operation experience;
- The core air tank is processed with advanced laser equipment and undergoes leak testing using ammonia leak detection equipment, ensuring an annual leak rate of less than 0.01%;
- Silicone rubber connectors are adopted for busbar connection, featuring direct plug-in installation that simplifies on-site installation work;



Product Structure Schematic Diagram

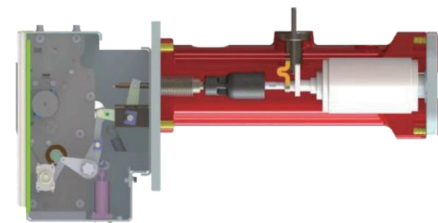


- | | |
|---------------------------------------|--------------------------------------|
| 1、Low-Voltage Compartment | 8、Cable Compartment |
| 2、Three-Position Operating Mechanism | 9、Busbar Connecting Bushing |
| 3、Compartment Connecting Bushing | 10、Three-Position Disconnecter |
| 4、Vacuum Circuit Breaker | 11、Testing Bushing |
| 5、Circuit Breaker Operating Mechanism | 12、Insulating Gas-Filled Compartment |
| 6、Cable Termination | 13、Pressure Relief Passage |
| 7、Cable | |

Main Component Design

【 Vacuum Circuit Breaker 】

- The functions of the vacuum circuit breaker include:
Closing and opening rated current;
Interrupting short-circuit current;
Performing grounding operation in cooperation with three-position switches;
- The three-phase poles of the circuit breaker are placed horizontally in the gas chamber, enabling convenient connection with other components;
- The operating mechanism of the circuit breaker is connected to the poles through a straight bellows to transmit power;



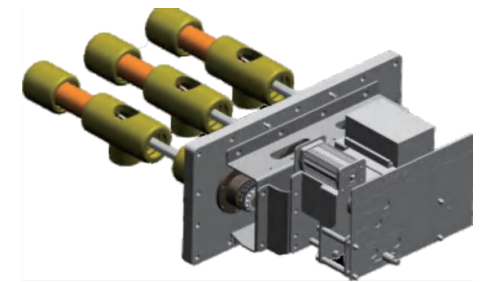
【 Technical Parameters of Vacuum Circuit Breaker 】

Serial Number	Item	Unit	Parameter
1	Rated Voltage	kV	40.5
2	Rated Frequency	Hz	50/60
3	Rated Current	A	630、1250、1600、2000、2500、3150
4	Rated Power Frequency Withstand Voltage (1min)	kV	95/110
5	Rated Lightning Impulse Withstand Voltage	kV	185/215
6	Rated Short-time Withstand Current	kA	31.5/4
7	Rated Peak Withstand Current	kA	80
8	Rated Short-circuit Breaking Current (RMS)	kA	31.5
9	Rated Short-circuit Making Current (Peak)	kA	80
10	Mechanical Life	Time	20000

Note: For any special requirements, please consult the manufacturer.

【 Three-position switch 】

- The functions of the three-position switch include: busbar connection, isolation and grounding;
- The three-position switch is located inside the gas chamber, while its operating mechanism module is situated outside the gas chamber.
- The connection between the two is achieved through a special magnetic fluid sealing structure;
- The moving contact is driven by an insulated lead screw;
- It adopts an intelligent modular design and can be operated manually or electrically;



【 Magnetic Fluid Sealing Structure 】

- ① Zero leakage; ② High reliability and long service life; ③ Excellent pressure resistance performance

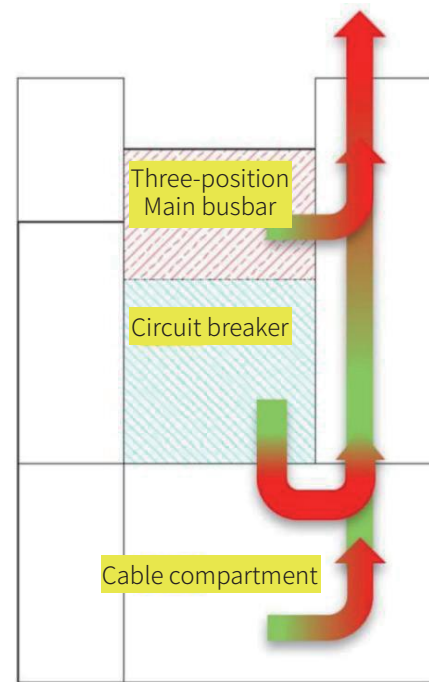


【 Technical Parameters of Disconnecter 】

Serial Number	Item	Unit	Parameter
1	Rated Voltage	kV	40.5
2	Rated Current	A	630、1250、1600、2000、2500、3150
3	Rated Power Frequency Withstand Voltage (1min)	kV	95/110
4	Rated Lightning Impulse Withstand Voltage	kV	185/215
6	Rated Short-time Withstand Current	kA	31.5/4
7	Rated Peak Withstand Current	kA	80
8	Phase Spacing	mm	170/210

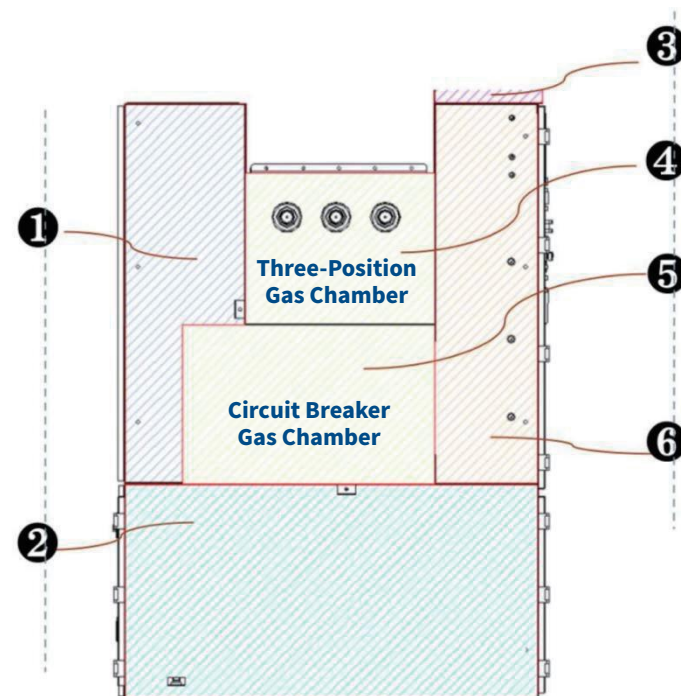
Note: For any special requirements, please consult the manufacturer.

【 Pressure Relief Path 】



Note: Pressure relief methods such as upward pressure relief, downward pressure relief, and pressure relief on both sides are supported. The specific method depends on on-site facilities.

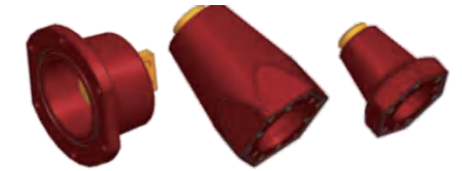
【 Dual-Air-Chamber Structural Scheme 】



- 1 Pressure Relief Channel
- 2 Cable Chamber
- 3 Small busbar and busbar chamber
- 4 Three-Position Gas Chamber
- 5 Circuit Breaker Gas Chamber
- 6 Operating Mechanism

【 Insulating Component 】

- Standard inner cone bushings, outer cone bushings and connectors are adopted, enabling simpler connection;



【 Busbar Connection Method 】

- Top Expansion Connection:
A fully insulated and fully enclosed standard European-style top expansion busbar system is adopted, enabling convenient installation;
A dedicated busbar connection device is used, allowing busbar connection to be carried out only externally; flexible expansion is achievable;
- Side Expansion Connection:
A dedicated side expansion busbar connector is adopted, making installation simple and fast;

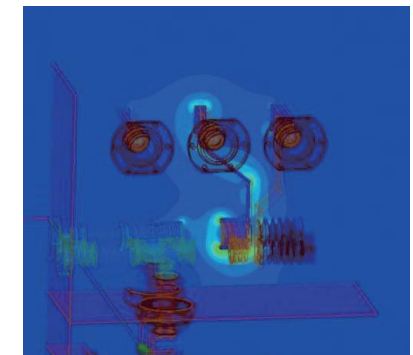
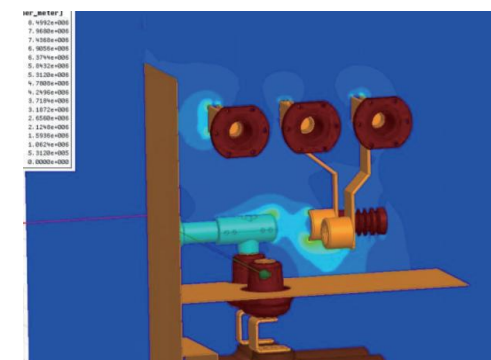


【 Plug-in Cable 】

- Fully insulated and fully shielded;
- Maintenance-free and easy to install;



【 Electromagnetic Field Analysis of C-GIS 】



【 Operation 】

- Manual Operation
Use a dedicated operating handle to operate the three-position disconnecter on the operation panel of the switchgear. During operation, the rotation direction of the handle shall be consistent with the diagram on the panel. Use a dedicated operating handle to perform the energy storage operation on the operation panel of the switchgear. During operation, the rotation direction of the handle shall be consistent with the diagram on the panel. Perform the opening and closing operations of the circuit breaker using the two buttons (i.e., "Open" and "Close") on the panel.
- Electric Operation
When the switchgear is equipped with an electric operating mechanism, connect the operating power supply, and use the secondary changeover switch to perform the opening and closing operations of the disconnecter. When the disconnecter is in the closed position and the circuit breaker has been charged with energy, perform the opening and closing operations of the circuit breaker using its secondary opening and closing buttons. If the switchgear fails to receive normal power supply from the operating power source, the switch actions can be completed through manual operation, following the method described above. It is strictly prohibited to insert the operating handle into the operation hole during electric operation; otherwise, electric operation will not be achievable (due to the presence of relevant interlocks).

【 Interlock 】

- After the disconnecter is closed, the earthing switch cannot be closed and the lower door cannot be opened.
- Only after the disconnecter is opened can the earthing switch be closed.
- After the earthing switch is closed, the disconnecter cannot be closed.
- The disconnecter can be closed only when the earthing switch is opened and the cabinet door is closed.
- The disconnecter can only be operated when the circuit breaker is in the open state.
- The lower door can be opened only when the earthing switch is closed and the circuit breaker is in the closed state.
- When the lower door is open, neither the earthing switch nor the circuit breaker can be operated.

【 General Technical Parameters 】

Serial Number	Item	Unit	Parameter
1	Product Model		NXTs-40.5
2	Rated Voltage (kV)	kV	40.5
3	Rated Frequency (Hz)	Hz	50/60
4	Rated Power Frequency Withstand Voltage (1min)	kV	95/110
5	Rated Lightning Impulse Withstand Voltage (kV)	kV	185/215
6	Rated Current of Main/Branch Bus (A)	A	630、1250、1600、2000、2500、3150
7	Rated Short-time Withstand Current (kA)	kA	25/31.5/40/4s
8	Rated Peak Withstand Current (kA)	kA	63/80/100
9	Rated Short-circuit Breaking Current	kA	31.5
10	Rated Short-circuit Making Current	kA	63/80/100
11	Protection Class of Gas-tight Chamber		IP67
12	Protection Class of Switchgear Cabinet		IP4X
13	Insulating Gas		SF6
14	Rated Working Pressure (20°C Gauge Pressure) (MPa)	Mpa	0.03 （relative pressure）
15	Minimum Working Pressure (20°C Gauge Pressure) (MPa)	Mpa	0.02 （relative pressure）
16	Rated Operating Sequence		O-0.3s-CO-3min-CO
17	Mechanical Life of Circuit Breaker	Times	20000
18	Mechanical Life of Three-position Mechanism	Times	2000
19	Rated Voltage of Auxiliary Circuit	V	DC24、48、110、220; AC220
20	Rated Power Frequency Withstand Voltage for 1min of Auxiliary Circuit	kV	2
21	Internal Arc Rating	kA/s	AFLR,31.5kA,1S
22	Annual Gas Leakage Rate		≤0.01%
23	Overall Dimension (W× D× H) (mm)		600/800x1400x2300

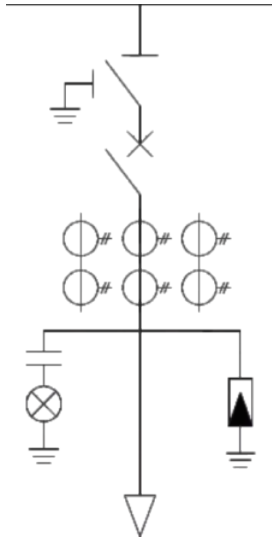
【 NXTs-V, Vacuum Circuit Breaker Unit 】

Functions

The vacuum circuit breaker is connected in series with a three-position disconnecter. The three-position disconnecter is placed on the busbar side, and the circuit breaker is placed on the cable side. This configuration is often used for the control and protection of lines and transformers.

Standard Configuration

- Main busbar current: 630A, 1250A, 1600A, 2000A, 2500A, 3150A
- Vacuum circuit breaker
- Three-position disconnecter
- Gas pressure gauge
- Spring operating mechanism
- Live-line indicator
- Mechanical five-prevention interlock device
- Current transformer
- Lightning arrester



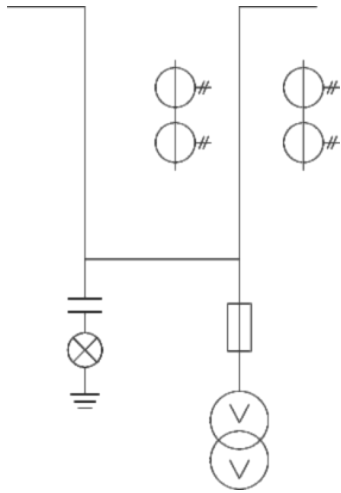
【 NXTs-M, Metering Unit 】

Functions

Used for measurement and billing in the electric power sector.

Standard Configuration

- Main busbar current: 630A, 1250A, 1600A, 2000A, 2500A, 3150A
- Current transformer
- Voltage transformer
- High-voltage fuse
- Gas pressure indicator gauge
- Live-line indicator
- Mechanical five-prevention interlock device



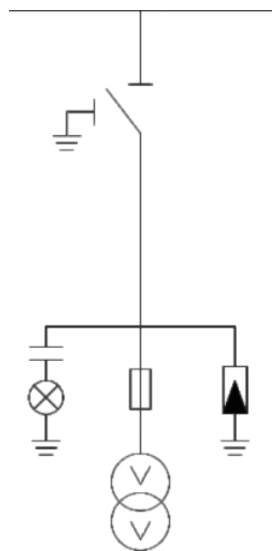
【 NXTs-PT, Busbar Potential Transformer Unit 】

Functions

Busbar Potential Transformer Cabinet, also known as Busbar Equipment Cabinet, is used for voltage measurement and protection of the busbar system. It can also draw operating power from the PT (Potential Transformer) to serve as the operating power supply for the switchgear.

Standard Configuration

- Main busbar current: 630A, 1250A, 1600A, 2000A, 2500A, 3150A
- Three-position disconnecter
- Gas pressure indicator gauge
- Live-line indicator
- Mechanical five-prevention interlock device
- Maintenance padlock device
- Voltage transformer
- High-voltage fuse
- Lightning arrester



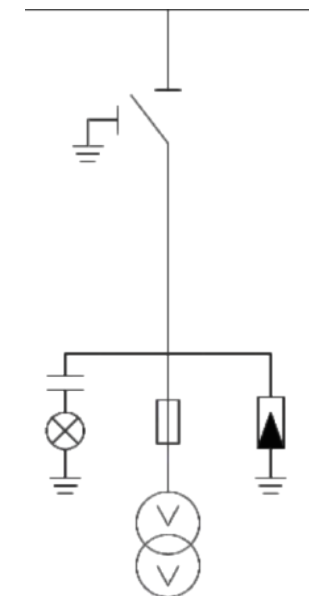
【 NXTs-D, Cable Direct Connection Unit 】

Functions

Incoming and outgoing cables are directly connected to the busbar. It is equipped with a metal stainless steel protective gas envelope, and is often used for connecting incoming and outgoing cables or serving as a tie-lift cabinet.

Standard Configuration

- Main busbar current: 630A, 1250A, 1600A, 2000A, 2500A, 3150A
- Live-line indicator
- Lightning arrester



【Optional Accessories】

- Pointer-type instrument

Two-in-one mechanical interlock

Fault indicator

Microcomputer-based protection

Base riser

Electric operating mechanism
- Cable accessories

Three-in-two mechanical interlock

Fault indicator (temperature measurement)

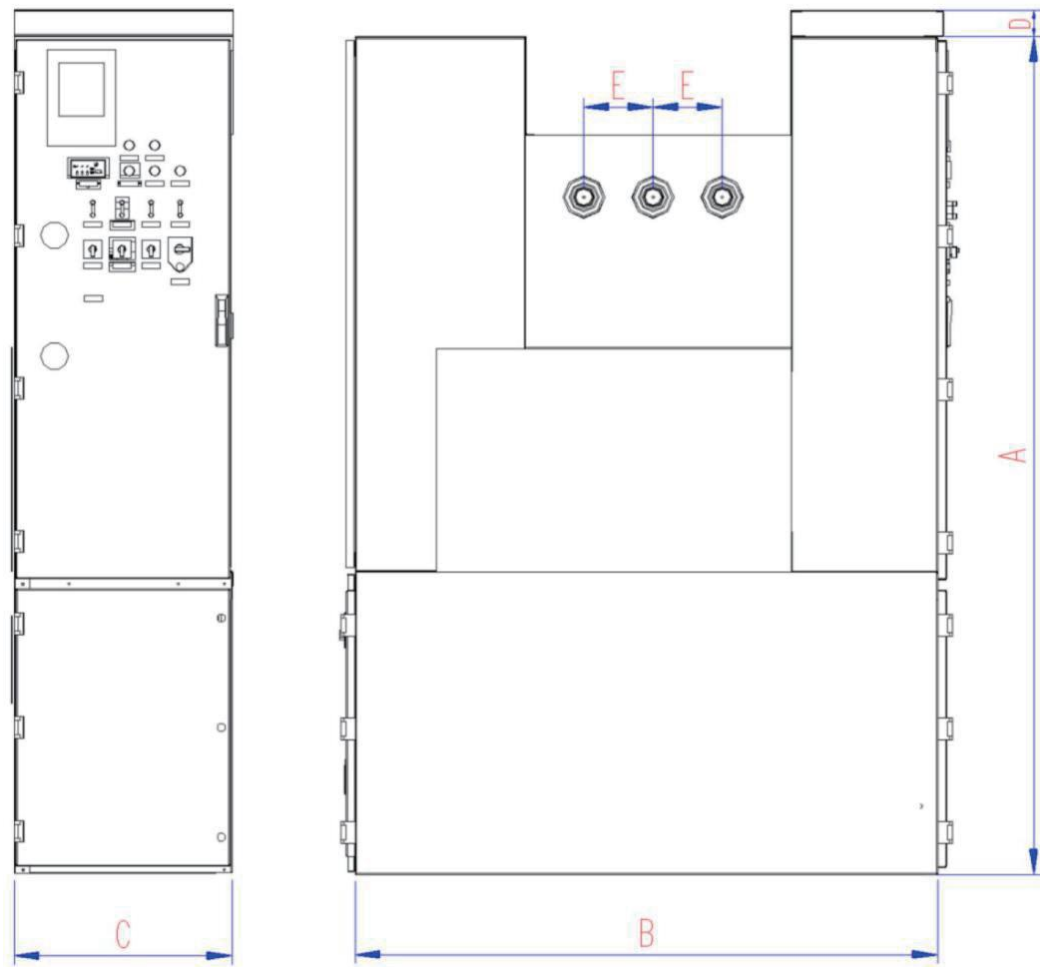
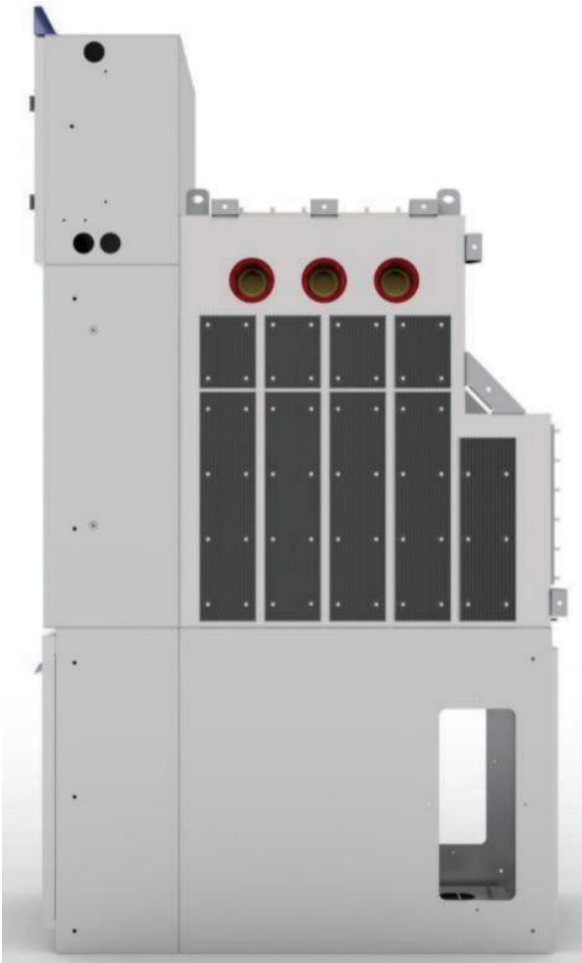
Digital display instrument

Backpack-type auxiliary cabinet
- Electromagnetic door lock

Incoming line grounding lockout device

Rectifier module

Dehumidification device



Serial Number	Item	Unit	Dimension	Description
1	A	mm	2400	Customizable according to customer requirements
2	B	mm	1450	Customizable according to customer requirements
3	C	mm	600/800/1000	≤1250A/2500A/3150A
4	D	mm	80/120	Single-layer Small Busway/Double-layer Small Busway
5	E	mm	190/200	630A~2500A/3150A

Note: Overall dimensions can be customized according to requirements.



Transportation Hubs



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PRECISION IN DETAIL