

**Giantele®**

# KYN-28

High voltage switchboard

*Our goal is the sea of stars!*

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# KYN-28

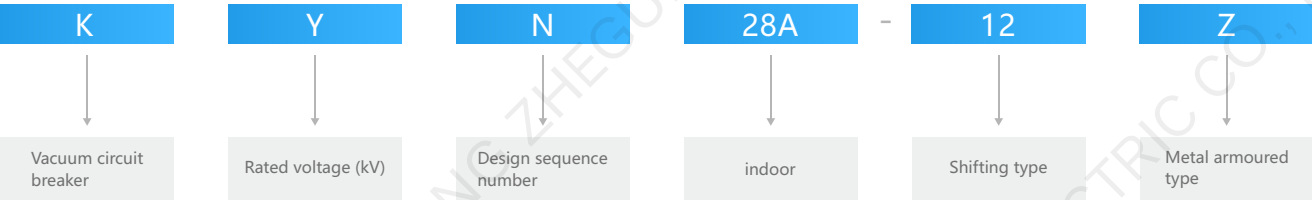
## New armored removable AC metal-enclosed switchgear

KYN28A-12(Z) (GZS1) type armoured disengaged AC metal enclosed switchgear (hereinafter referred to as "switchgear") It is suitable for three-phase AC 50Hz power system, used to receive and distribute electrical energy and control, protect and monitor the circuit.

This product conforms to the standards: GB3906 "3~35kV AC metal enclosed switchgear", GB/T11022 "High voltage switchgear and control equipment standard common technical requirements", IEC60298 "rated voltage 1kV and above AC metal enclosed switchgear and control equipment".



Model meaning



Conditions of use

Ambient air temperature: maximum temperature +40°C, minimum temperature -15°C;

Relative humidity: daily average relative humidity: ≤ 95%, daily average water vapor pressure does not exceed 2.2KPa; Monthly average relative humidity ≤ 90%; The average monthly steam pressure does not exceed 1.8KPa;

Altitude: ≤ 1000m;

Earthquake intensity: not more than 8 magnitude;

The surrounding air should be free from corrosive or flammable gases, water vapor and other obvious pollution;

No severe vibration site;

If it is used under normal conditions beyond GB3906, the user and the Company shall negotiate.

Technical parameter

| Item                                                                |                                       | Unit | Data                                                                                            |
|---------------------------------------------------------------------|---------------------------------------|------|-------------------------------------------------------------------------------------------------|
| Rated voltage                                                       |                                       | kV   | 3.6、7.2、12                                                                                      |
| Rated frequency                                                     |                                       | Hz   | 50                                                                                              |
| Circuit breaker rated current                                       |                                       | A    | 630、1250、1600、2000、2500、3150                                                                    |
| Rated current of switchgear                                         |                                       | A    | 630、1250、1600、2000、2500、3150                                                                    |
| Rated short-time withstand current (4S)                             |                                       | kA   | 20、25、31.5、40                                                                                   |
| Rated peak withstand current (peak)                                 |                                       | kA   | 50、63、80、100                                                                                    |
| Rated short-circuit breaking current                                |                                       | kA   | 20、25、31.5、40                                                                                   |
| Rated short circuit closing current (peak)                          |                                       | kA   | 50、63、80、100                                                                                    |
| Rated insulation level<br>1min power frequency<br>withstand voltage | Between poles,<br>poles to the ground | kV   | 24、32、42                                                                                        |
|                                                                     | Between fractures                     | kV   | 24、32、42                                                                                        |
| Lightning impulse<br>Withstand voltage<br>(peak)                    | Between poles,<br>poles to the ground | kV   | 40、60、75                                                                                        |
|                                                                     | Between fractures                     | kV   | 46、70、85                                                                                        |
| Class of protection                                                 |                                       |      | The enclosure is IP4X, and the compartment and circuit breaker room doors are IP2X when opened. |

VD4, VS1-12 vacuum circuit breaker technical parameters

| Item                                                   |                                           | Unit  | Data                         |
|--------------------------------------------------------|-------------------------------------------|-------|------------------------------|
| Rated voltage                                          |                                           | kV    | 12                           |
| Rated frequency                                        |                                           | Hz    | 50                           |
| Circuit breaker rated current                          |                                           | A     | 630、1250、1600、2000、2500、3150 |
| Rated dynamic stability current (4S)                   |                                           | kA    | 16、20、25、31.5、40、50          |
| Rated stable current (peak)                            |                                           | kA    | 40、50、63、80、100、125          |
| Rated short-circuit breaking current                   |                                           | kA    | 16、20、25.31.5、40、50          |
| Rated short circuit closing current (peak)             |                                           | kA    | 40、50、63、80、100、125          |
| Rated insulation level                                 | 1min power frequency<br>withstand voltage | kV    | 42                           |
|                                                        | Lightning impulse<br>withstand voltage    | kV    | 75                           |
| Rated operating sequence                               |                                           |       | O-0.3S-CO-180S-CO            |
| Rated short circuit breaking current<br>breaking times |                                           | Times | 50                           |
| Mechanical life                                        |                                           | Times | 20000                        |

VD4, VS1 vacuum circuit breaker mechanical characteristics

| Item                                     |             | Unit | Data            |
|------------------------------------------|-------------|------|-----------------|
| Contact opening distance                 |             | mm   | 11±1            |
| overtravel                               |             | mm   | 4±0.5           |
| Interphase center distance               |             | mm   | 210±0.5、275±0.5 |
| Closing contact bounce time              |             | ms   | ≤2              |
| Three phase switching is different       |             | ms   | ≤2              |
| Switching time when<br>operating voltage | The highest | ms   | ≤ 50            |
|                                          | Rated       | ms   | ≤ 50            |
|                                          | Minimum     | ms   | ≤ 60            |
| Closing time                             |             | ms   | ≤ 100           |
| Average closing speed                    |             | m/s  | 0.9-1.2         |
| Average opening speed                    |             | m/s  | 0.6-0.8         |

When the circuit breaker is used to control the 3-10kV motor, if the starting current is less than 600A, metal zinc oxide arrester must be added, and its specific requirements are negotiated by the user and our company; when the circuit breaker is used to open and power the container group, the rated current of the capacitor should not be greater than 80% of the rated current of the circuit breaker.

Operating mechanism technical parameters

| Item                                  |              | Unit | Data         |
|---------------------------------------|--------------|------|--------------|
| Rated operating voltage               | Closing coil | V    | AC/DC220,110 |
|                                       | Opening coil | V    | AC/DC220,110 |
| Coil power                            | Closing coil | W    | 245          |
|                                       | Opening coil | W    | 245          |
| Energy storage motor power            |              | W    | 50           |
| Rated voltage of energy storage motor |              | V    | AC/DC220,110 |
| Energy storage time                   |              | s    |              |

Structural characteristics

The switchgear is designed according to the armored metal enclosed switchgear in GB3906-91. The whole is composed of two parts (see Figure 1) : the cabinet and the middle withdrawable part (i.e. the hand car). The cabinet is divided into four separate compartments1 The shell protection level is IP4X, and the class of each compartment and circuit breaker room is IP2X when the door is opened. It has aerial inlet and outlet lines, cable inlet and outlet lines and other functional schemes, and forms a complete set of distribution system 1 system device after arrangement and combination. The switchgear can be installed, debug and maintained from the front, so it can be back-to-back, composed of dual arrangements and installed against the wall, improving the safety and flexibility of the switchgear and reducing the footprint.

Enclosures and others

The main cabinet frame of the switchgear is made of aluminum-zinc thin steel plate, processed by CNC machine tool, and adopts multiple flanging process, so that the whole cabinet not only has the advantages of high precision, strong corrosion resistance and oxidation resistance, but also makes the cabinet light in weight, high mechanical strength and beautiful appearance than other similar equipment cabinets due to the use of multiple flanging process. The cabinet body is assembled and connected with riveted nuts and high-strength bolts, so that the processing cycle is short, the parts are versatile, the area is small, and the production is easy to organize.

Handcart

The frame of the handcart is made of thin steel plate processed by CNC machine tool and assembled. The hand car is insulated with the cabinet body, and the mechanism interlock is safe, reliable and flexible. According to the use, the handcart can be divided into circuit breaker handcart, voltage transformer handcart, metering handcart, isolation handcart and so on. All kinds of handcarts according to the module, block type change, the same specification of handcarts can be 100 percent free interchange. The handcart has a disconnect position, a test position and a working position in the cabinet, and each position is equipped with a positioning device to ensure that the interlock is reliable, and must be operated according to the interlock anti-error operation procedure. All kinds of handcart are carried out by nut and screw to push forward and exit, and its operation is light and flexible, suitable for the operation of the personnel on duty. When the hand car needs to remove the cabinet, with a special transfer car, it can be easily extracted for various inspections and maintenance: and the use of mid-mounted, the whole hand car is small in size, inspection and maintenance is very convenient.

Compartment

The main electrical components of the switchgear have their own independent compartments, namely: circuit breaker handcart room, bus bar room, cable room, relay instrument room. The protection level of each compartment reaches IP2X; In addition to the relay room, the other three compartments have their own pressure relief channels. Due to the use of mid-mounted form, the cable room space is greatly increased, so the equipment can be connected to multiple cables.

Breaker compartment

Rails are installed on both sides of the compartment for the handcart 5 to slide from the disconnecting position and the test position to the working position in the cabinet, and the partition board 3(valve) of the static contact box 16 is installed behind the rear wall of the compartment. When the handcar moves from the disconnecting position and the test position to the working position, the valve on the upper and lower static contact boxes are linked with the handcar and automatically open at the same time; When moving in the opposite direction, the valve is automatically closed until the hand car has retreated to a certain position and completely covers the static contact box, forming an effective isolation. Since the upper and lower valves can be operated separately, the valve on the live side can be locked during maintenance, so as to ensure that the maintenance and maintenance personnel do not touch the live body. When the circuit breaker room door is closed, the hand car can also be operated. Through the observation window of the middle door, the hand car in the compartment can be observed, the closing position and the energy storage condition can be displayed.

Bus compartment

The main busbar 18 is a single splicing through each other, fixed by a busbar 20 and a static contact box. The main busbar and the connecting busbar are rectangular copper bars, which are composed of two busbars when the current load is high. The branch busbar is bolted to the static contact box 16 and the main busbar, and no other support is required. For special needs, the busbars can be covered with heat shrink bushing and connecting bolt insulation sleeves and end caps, and the busbars in adjacent cabinets are fixed with bushing 19. In this way, the air buffer retained between the bus bars can prevent melting if there is an internal fault arc, and the casing 19 can effectively limit the accident to the cabinet and not spread to other cabinets.

Structural characteristics

The switchgear structure is shown below. All-metal modular assembly structure, the cabinet is made of imported aluminum-zinc plate with strong anti-corrosion ability, without surface treatment, processed by CNC high-precision equipment, using advanced multiple flanging technology, and connected with rivet nuts and high-strength bolts, high precision, light weight and good strength.

The switchgear can be equipped with VS1 series, VD4 series, ZN65 series and other vacuum circuit breakers produced by our company, which has wide adaptability and strong interchangeability. The handcart is provided with a working position and a test position, and each position is equipped with a positioning and display device, which is safe and reliable.

The cable room can be equipped with up to 9 single-core cables, and the equipment has a reliable mechanical and electrical interlocking device, which fully meets the requirements of "five defenses". Each room is equipped with pressure relief channel to ensure personal safety.

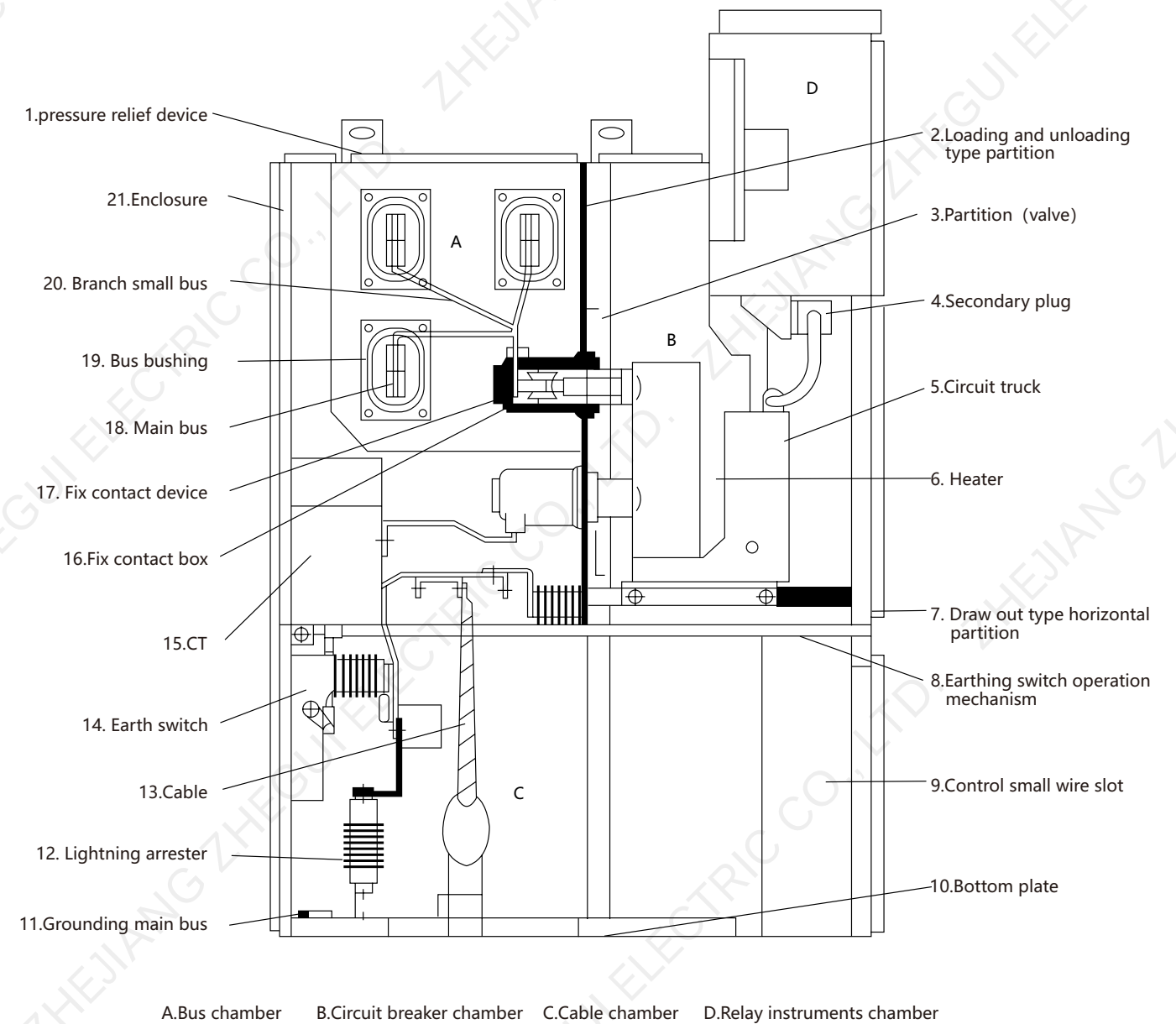
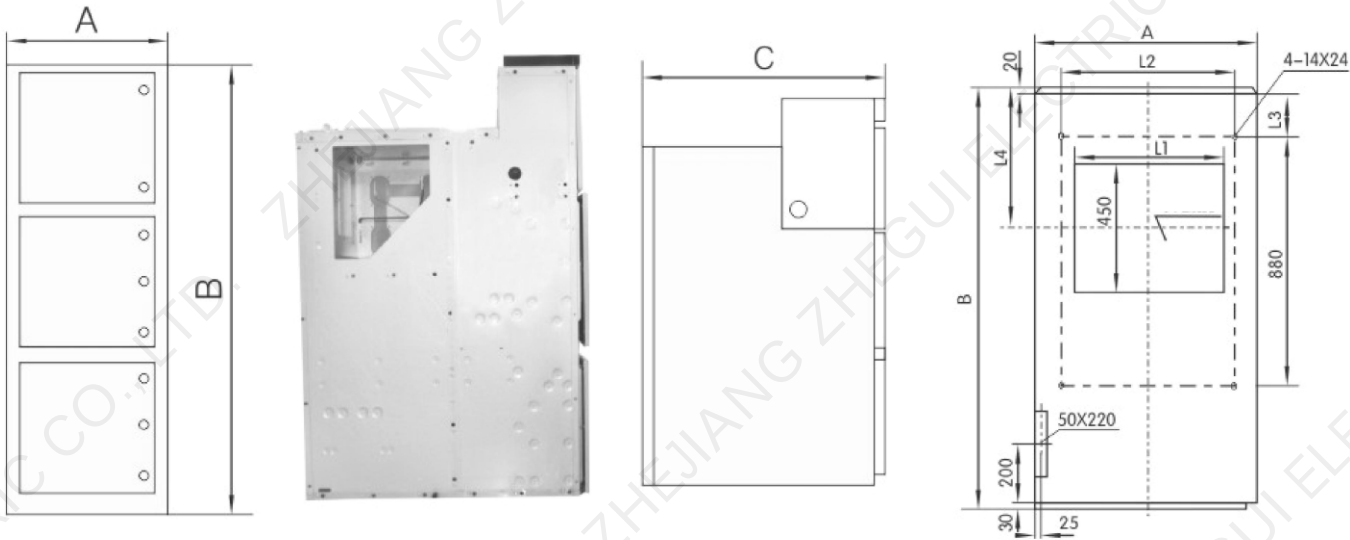


Figure 1 Schematic diagram of switchgear structure

○ Mounting size (mm)



○ Mounting size (mm)

|          |                                                                       | mm         |
|----------|-----------------------------------------------------------------------|------------|
| Height B |                                                                       | 2300(2200) |
| Width A  | Rated current up to 1250A                                             | 800        |
|          | Rated current 1600A and above<br>(altitude 4000m rated current 1250A) | 1000       |
| Depth C  | Cable inlet and outlet                                                | 1500       |
|          | Overhead inlet and outlet line                                        | 166        |

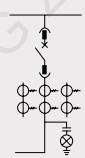
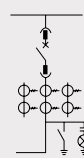
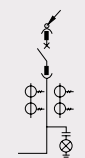
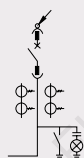
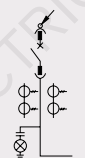
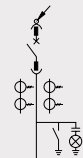
|                 |                 | mm           |
|-----------------|-----------------|--------------|
| Cabinet width A | Cabinet depth B | L1L2L3L4     |
| 800             | 1500 Cable      | 530630150490 |
|                 | 1660 Aerial     | 530630310650 |
| 1000            | 1500 Cable      | 730830150490 |
|                 | 1660 Aerial     | 730830310650 |

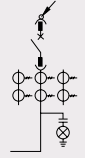
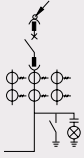
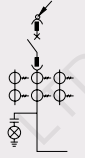
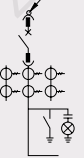
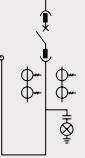
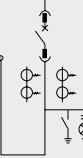
○ Main circuit scheme diagram

| Scheme number                    | 01                                                                                                                                                      | 02 | 03 | 04 | 05 | 06 |
|----------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------|----|----|----|----|----|
| Main circuit scheme diagram      |                                                                                                                                                         |    |    |    |    |    |
| Cabinet dimensions (W x D x H)mm | 800(1000)×1500×2300                                                                                                                                     |    |    |    |    |    |
| Rated current (A)                | 630~3150                                                                                                                                                |    |    |    |    |    |
| Major electrical component       | Vacuum circuit breaker (VS1 or VD4)                                                                                                                     | 1  | 1  | 1  | 1  | 1  |
|                                  | Current transformer LZZBJ9 series                                                                                                                       | 2  | 2  | 2  | 3  | 3  |
|                                  | Ground switch JN15                                                                                                                                      |    | 1  | 1  | 1  | 1  |
|                                  | Lightning arrester HY5W                                                                                                                                 |    |    | 3  |    | 3  |
| Loop name                        | Receive electricity, feed electricity                                                                                                                   |    |    |    |    |    |
| Remark                           | 1, rated current 1600A and above, cabinet width is 1000mm.<br>2, altitude 3000m~4000m plateau type switchgear rated current 1250A, cabinet width 1000m. |    |    |    |    |    |

| Scheme number                    | 07                                                                            | 08              | 09             | 10             | 11              | 12              |
|----------------------------------|-------------------------------------------------------------------------------|-----------------|----------------|----------------|-----------------|-----------------|
| Main circuit scheme diagram      |                                                                               |                 |                |                |                 |                 |
| Cabinet dimensions (W x D x H)mm | 800(1000)×1500×2300                                                           |                 |                |                |                 |                 |
| Rated current (A)                | 630~3150                                                                      |                 |                |                |                 |                 |
| Major electrical component       | Vacuum circuit breaker (VS1 or VD4)                                           | 1               | 1              | 1              | 1               | 1               |
|                                  | Current transformer LZZBJ9 series                                             | 2               | 2              | 2              | 3               | 3               |
|                                  | Ground switch JN15                                                            |                 | 1              | 1              |                 | 1               |
| Loop name                        | Contact (right)                                                               | Contact (right) | Contact (left) | Contact (left) | Contact (right) | Contact (right) |
| Remark                           | The rated current is 1600A and above, and the width of the cabinet is 1000mm. |                 |                |                |                 |                 |

○ Main circuit scheme diagram

| Scheme number                    |                                     | 13                                                                                | 14                                                                                | 15                                                                                | 16                                                                                 | 17                                                                                  | 18                                                                                  |
|----------------------------------|-------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| Main circuit scheme diagram      |                                     |  |  |  |  |  |  |
| Cabinet dimensions (W x D x H)mm |                                     | 800(1000)×1660×2300                                                               |                                                                                   |                                                                                   |                                                                                    |                                                                                     |                                                                                     |
| Rated current (A)                |                                     | 630~3150                                                                          |                                                                                   |                                                                                   |                                                                                    |                                                                                     |                                                                                     |
| Major electrical component       | Vacuum circuit breaker (VS1 or VD4) | 1                                                                                 | 1                                                                                 | 1                                                                                 | 1                                                                                  | 1                                                                                   | 1                                                                                   |
|                                  | Current transformer LZZBJ9 series   | 3                                                                                 | 3                                                                                 | 2                                                                                 | 3                                                                                  | 2                                                                                   | 2                                                                                   |
|                                  | Ground switch JN15                  |                                                                                   | 1                                                                                 |                                                                                   | 1                                                                                  |                                                                                     | 1                                                                                   |
| Loop name                        |                                     | Contact (left)                                                                    | Contact (left)                                                                    | Overhead line (left link)                                                         | Overhead line (right link)                                                         | Overhead line (right link)                                                          | Overhead line (right link)                                                          |
| Remark                           |                                     | The rated current is 1600A and above, and the width of the cabinet is 1000mm.     |                                                                                   |                                                                                   |                                                                                    |                                                                                     |                                                                                     |

| 方案号                              |                                     | 19                                                                                  | 20                                                                                  | 21                                                                                  | 22                                                                                   | 23                                                                                    | 24                                                                                    |
|----------------------------------|-------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|
| Main circuit scheme diagram      |                                     |  |  |  |  |  |  |
| Cabinet dimensions (W x D x H)mm |                                     | 800(1000)×1660×2300                                                                 |                                                                                     |                                                                                     |                                                                                      |                                                                                       |                                                                                       |
| Rated current (A)                |                                     | 630~3150                                                                            |                                                                                     |                                                                                     |                                                                                      |                                                                                       |                                                                                       |
| Major electrical component       | Vacuum circuit breaker (VS1 or VD4) | 1                                                                                   | 1                                                                                   | 1                                                                                   | 1                                                                                    | 1                                                                                     | 1                                                                                     |
|                                  | Current transformer LZZBJ9 series   | 3                                                                                   | 3                                                                                   | 3                                                                                   | 3                                                                                    | 2                                                                                     | 2                                                                                     |
|                                  | Ground switch JN15                  |                                                                                     | 1                                                                                   |                                                                                     | 1                                                                                    |                                                                                       | 1                                                                                     |
| Loop name                        |                                     | Contact (left)                                                                      | Contact (left)                                                                      | Overhead line (left link)                                                           | Overhead line (left link)                                                            | Overhead inlet and outlet line                                                        | Overhead inlet and outlet line                                                        |
| Remark                           |                                     | The rated current is 1600A and above, and the width of the cabinet is 1000mm.       |                                                                                     |                                                                                     |                                                                                      |                                                                                       |                                                                                       |

○ Order instructions

The following technical information should be provided when ordering:

1. Main circuit scheme drawing number, use and main wiring system drawing, distribution room layout and arrangement diagram, etc.
2. Requirements for the control, measurement and protection functions of switchgear and for other locking and automatic devices.
3. Type, specification and quantity of the main electrical components in the switchgear.
4. if the switchgear between or into the cable cabinet need bus bridge connection, should provide the bus bridge rated load, bus bridge span, height from the ground and other specific requirements of the data.
5. When the switchgear is used in special environmental conditions, it should be explained in detail when ordering.
6. Other special requirements.