

## Summary

MRGXGN-12 solid insulation ring network switchgear is a new generation of environment-friendly composite insulation ring network cabinet produced by our company. It is a fully sealed power supply unit. All live parts and switches are fully sealed in an epoxy plastic housing without SF6 gas. The whole switch device is not affected by the external environment, ensuring operation reliability and personal safety, and realizing maintenance free. The solid insulated ring network cabinet is composed of three types of switches, namely, V unit (circuit breaker unit), C unit (load switch unit) and F unit (combined electrical unit). Each unit can be used independently or expanded freely. Its structure is divided into intelligent control instrument room, operating mechanism and primary part. The instrument room can be equipped with microcomputer protection (controller), and the primary part adopts APG automatic gel process, Isolating switch and arc extinguishing chamber shall be completely sealed in epoxy resin, and special joint shall be connected with bus. The arc extinguishing chamber adopts special copper chromium contact material, R type longitudinal magnetic field contact, and complete primary sealing and discharging process. The ability and stability of breaking short circuit current, electrical life, temperature rise, and insulation level of this arc extinguishing chamber are significantly improved compared with the previous arc extinguishing chamber (copper aluminum contact material, cup shaped longitudinal magnetic field contact structure, and incomplete primary sealing and discharging process). The operating mechanism adopts a spring operating mechanism that is integrated with the switch, that is, the isolating switch and the main switch spring operating mechanism are integrated, which can facilitate interlocking. Besides, there are few parts of the mechanism, which reduces unnecessary transmission links, has high reliability, and can realize electric operation according to user needs. Solid insulated totally enclosed switchgear: it is a kind of module with full insulation and sealing performance that is encapsulated by solid insulating medium after single or combined main electrical circuits such as solid insulating material as main insulating medium and conductive connection, disconnecter, grounding switch, main bus, branch bus, etc. are used to wrap and encapsulate into one or several modules with full insulation and sealing performance that have certain functions and can be combined or expanded again. The loop network unit is applicable to the 12kV, 50Hz three-phase AC power distribution system for loop network power supply or terminal power supply. The ring network unit can be installed in the power distribution system of industrial and mining enterprises, residential quarters, schools, parks, etc., and can also be installed in a compact box type substation for the control and protection of distribution transformers. Therefore, indoor and outdoor ring network units can realize power distribution automation.

## 型号含义 Type meaning



## Environmental conditions

- ◇ Suitable for indoor or outdoor use ;
- ◇ Ambient air temperature: indoor -10°C ~ +25°C, outdoor -60°C ~ +60°C;
- ◇ Relative air humidity: the daily average value is not more than 95%, and the monthly average value is not more than 90%;
- ◇ The altitude is not more than 3000m;
- ◇ The surrounding air shall not be obviously polluted by dust, water vapor, salt mist, corrosive gas or combustible gas;
- ◇ The outdoor type can be used in severe environmental conditions ;
- ◇ The installation site shall be free of violent vibration, and the seismic intensity shall not exceed 8 degrees.

Note: When the above operating environmental conditions cannot meet the operating requirements, the user shall negotiate with the manufacturer.

## 主要技术参数 The main technical parameters

◆ 开关设备的总体技术参数如表所示 The overall technical parameters of the switchgear are shown in the table

序号 Serial No	名称 Name	单位 Unit	参数 Parameter
1	额定电压 Rated voltage	kV	12
2	额定电流 Rated current	A	630
3	额定短时耐受电流 (4s) Rated short-time withstand current (4s)	kA	25
4	额定峰值耐受电流 Rated peak withstand current	kA	50
5	额定短路关合电流 (峰值) Rated short-circuit making current (peak value)	kA	50
6	额定有功负载开断电流 Rated Active load breaking current	A	630
7	额定闭环开断电流 Rated closed-loop breaking current	A	630
8	额定电缆充电开断电流 Rated cable charging breaking current	A	10
9	组合电器额定开断转移电流 Rated breaking transfer current of combined apparatus	A	3700
10	1min 工频耐受电压 1min power frequency withstand voltage	相间 相对地 真空断口 Phase to ground vacuum fracture	kV 42
		隔离断口 Isolating fracture	kV 48
11	雷电冲击耐受电压 Lightning impulse withstand voltage	相间 相对地 真空断口 Phase to ground vacuum fracture	kV 75
		隔离断口 Isolating fracture	kV 85
12	机械寿命 Mechanical life	断路器 Circuit breaker	次 Times 10000
		隔离刀、接地刀 Isolating knife, grounding knife	次 Times 3000
13	防护等级 Degree of protection		IP4X
14	外壳防护等级 Enclosure protection grade		IP4X
15	局部放电 Partial discharge	pC	≤ 20(1.2Ur 下测量) ≤ 20 (measured under 1.2Ur)

◆ 断路器柜的额定参数如表所示 The rated parameters of the circuit breaker cabinet are shown in the table

序号 Serial No	名称 Name	单位 Unit	参数 Parameter	
1	额定电压 Rated voltage	kV	12	
2	额定电流 Rated current	A	630	
3	额定电缆充电开断电流 Rated cable charging breaking current	A	10	
4	额定短时耐受电流 (4S) Rated short-time withstand current (4S)	kA	25	
5	额定峰值耐受电流 Rated peak withstand current	kA	50	
6	额定短路开断电流 Rated short-circuit breaking current	kA	25	
7	触头开距 Contact opening	mm	9±1	
8	超行程 Overtravel	mm	3.0±0.5	
9	相间中心距 Center distance between phases	mm	130±1.5	
10	主回路电阻 Main circuit resistance	μΩ	≤ 350	
11	合闸时间 Closing time	ms	25 ~ 60	
12	分闸时间 Opening time	ms	17 ~ 45	
13	1min 工频耐受电压 1min power frequency withstand voltage	相间 相对地 真空断口 Phase to ground vacuum fracture	kV	42
		隔离断口 Isolating fracture	kV	48
14	雷电冲击耐受电压 Lightning impulse withstand voltage	相间 相对地 真空断口 Phase to ground vacuum fracture	kV	75
		隔离断口 Isolating fracture	kV	85
15	机械寿命 Mechanical life	断路器 Circuit breaker	次 Times	10000
		隔离刀、接地刀 Isolating knife, grounding knife	次 Times	3000
16	断路器 Circuit breaker	平均合闸速度 Average closing speed	m/s	0.9±0.2
		平均分闸速度 Average opening speed	m/s	1.3±0.2
		三相不同期性 Three phase dissimilarity	ms	≤ 2
17	局部放电 Partial discharge	pC	≤ 20(1.2Ur 下测量) ≤ 20 (measured under 1.2Ur)	

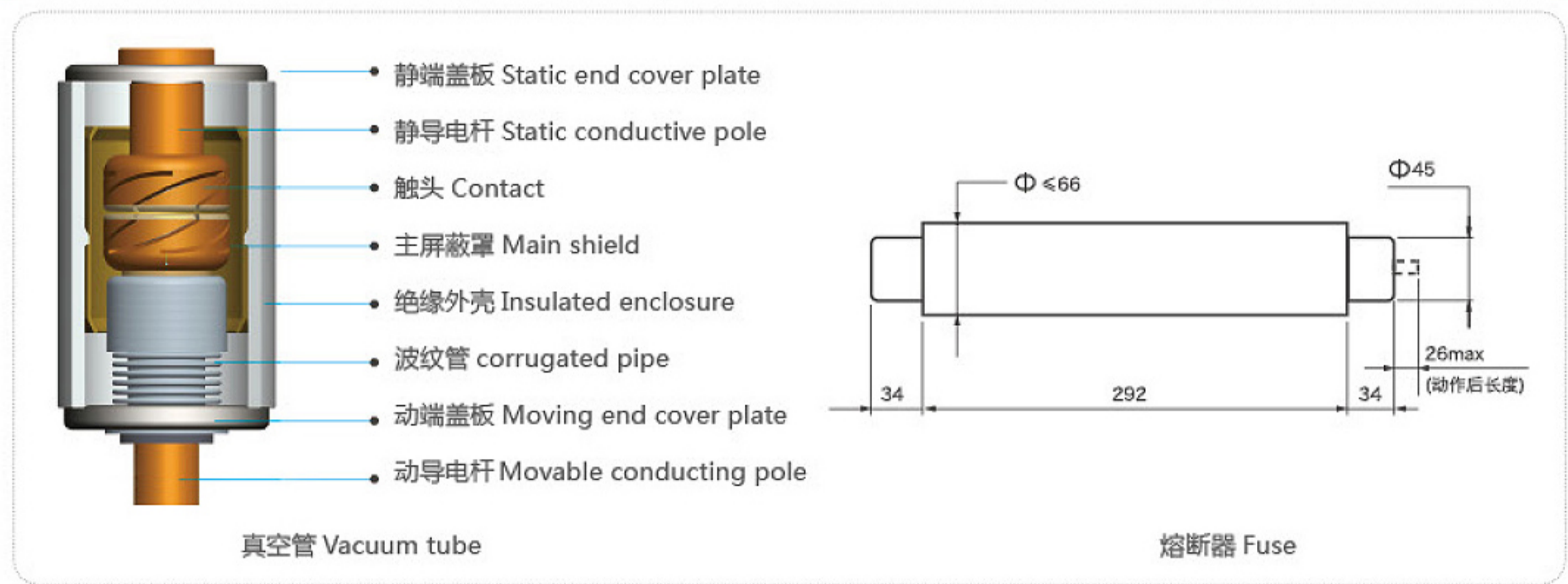
◆ 负载开关柜的额定参数如表所示 The rated parameters of the load switch cabinet are shown in the table

序号 Serial No	名称 Name	单位 Unit	参数 Parameter
1	额定电压 Rated voltage	kV	12
2	额定电流 Rated current	A	630
3	额定短时耐受电流 (4S) Rated short-time withstand current (4S)	kA	25
4	额定峰值耐受电流 Rated peak withstand current	kA	50
5	额定短路关合电流 (峰值) (E2) Rated short-circuit making current (peak value) (E2)	kA	50(3 次 Times)
6	额定有功负载开断电流 Rated Active load breaking current	A	630
7	额定接地故障开断电流 Rated earth fault breaking current	A	30
8	额定线路充电开断电流 Rated line charging breaking current	A	10
9	额定闭环开断电流 Rated closed-loop breaking current	A	630
10	触头开距 Contact opening	mm	9±1
11	超行程 Overtravel	mm	3.0±0.5
12	相间中心距 Center distance between phases	mm	130±1.5

序号 Serial No	名称 Name	单位 Unit	参数 Parameter	
13	主回路电阻 Main circuit resistance	μΩ	≤ 350	
14	合闸时间 (含储能时间) Closing time (including energy storage time)	s	≤ 10	
15	分闸时间 Opening time	ms	17 ~ 45	
16	1min 工频耐受电压 1min power frequency withstand voltage	相间 相对地 真空断口 Phase to ground vacuum fracture	kV	42
		隔离断口 Isolating fracture	kV	48
17	雷电冲击耐受电压 Lightning impulse withstand voltage	相间 相对地 真空断口 Phase to ground vacuum fracture	kV	75
		隔离断口 Isolating fracture	kV	85
18	机械寿命 Mechanical life	负荷开关 Load switch	次 Times	10000
		隔离刀、接地刀 Isolating knife, grounding knife	次 Times	3000
19	负荷开关 Load switch	平均合闸速度 Average closing speed	m/s	0.9±0.2
		平均分闸速度 Average opening speed	m/s	1.3±0.2
		三相不同期性 Three phase dissimilarity	ms	≤ 2
20	局部放电 Partial discharge	pC	≤ 20(1.2Ur 下测量) ≤ 20 (measured under 1.2Ur)	

◆ 组合电器柜的额定参数如表所示 The rated parameters of the combined electrical cabinet are shown in the table

序号 Serial No	名称 Name	单位 Unit	参数 Parameter	
1	额定电压 Rated voltage	kV	2	
2	额定电流 Rated current	A	125	
3	额定频率 Rated frequency	Hz	50	
4	额定短路开断电流 Rated short-circuit breaking current	kA	31.5	
5	组合电器额定开断转移电流 Rated breaking transfer current of combined apparatus	A	3700	
6	主回路电阻 (不含熔断器) Main circuit resistance (excluding fuse)	$\mu\Omega$	750	
7	1min 工频耐受电压 1min power frequency withstand voltage	相间 相对地 真空断口 Phase to ground vacuum fracture	kV	42
		隔离断口 Isolating fracture	kV	48
8	雷电冲击耐受电压 Lightning impulse withstand voltage	相间 相对地 真空断口 Phase to ground vacuum fracture	kV	75
		隔离断口 Isolating fracture	kV	85
9	机械寿命 Mechanical life	断路器 Circuit breaker	次 Times	10000
		隔离刀、接地刀 Isolating knife, grounding knife	次 Times	3000
10	辅助回路 1min 工频耐受电压 (电压高于 110V) 1min power frequency withstand voltage of auxiliary circuit (voltage higher than 110V)	kV	2.5	
11	局部放电 Partial discharge	pC	$\leq 20(1.2U_r \text{ 下测量})$ $\leq 20 \text{ (measured under } 1.2U_r)$	



#### Compliance with standards

- ◇ IEC62271-1-2007 High Voltage Switchgear and Controlgear - Part 1: General Specification
- ◇ IEC620071-200-20031~52kVAC Metal Enclosed Switchgear and Control Equipment
- ◇ GB3906-2006 3.6~40.5kVAC Metal Enclosed Switchgear and Control Equipment
- ◇ GB/T11022-2011 Common Technical Conditions for High Voltage Switchgear and Control Equipment Standards
- ◇ GB1984-2014 High Voltage AC Circuit Breaker
- ◇ DL/T404-2007 3.6kV~40.5kVAC Metal Enclosed Switchgear and Control Equipment
- ◇ DL/T593-2016 Common Technical Conditions for High Voltage Switchgear and Control Equipment Standards
- ◇ Q/GDW730-2012 Technical Conditions for 12kV Solid Insulation Ring Main Unit
- ◇ GB1985-2014 High Voltage AC Disconnectors and Earthing Switches
- ◇ GB3804-2004 3.6kV~40.5kV High Voltage AC Load Switch
- ◇ DL/T402-2016 High Voltage AC Circuit Breaker

#### Selection Table of Fuse and Transformer

- ◇ It has the following distinctive features:
- ◇ Combined with vacuum load switch, transfer current can reach 3150A;
- ◇ Full series of distribution transformer protection, the maximum fusible core current can reach 200A;
- ◇ Double grounding protection, reliable five prevention interlocking, and higher safety performance;
- ◇ Standard fuse shall be selected to facilitate user's spare parts.

变压器初级电压 (kV) Primary voltage of transformer (kV)	熔断器额定电流 (A) Rated current of fuse (A)	变压器额定容量 (kVA) Rated capacity of transformer (kVA)															
		25	50	75	100	125	160	200	250	315	400	500	630	800	1000	1250	1600
3	16	20	31.5	40	50	50	63	80	100	125	160						
3.3	10	20	25	40	40	40	63	80	80	125	125	160					
6	6	16	20	25	25	31.5	40	50	50	63	80	100	125	160			
10	6	10	10	16	20	25	25	31.5	40	50	50	63	80	100	125		
11	6	10	10	16	20	20	25	25	40	40	50	50	63	80	100	125	

#### Security and protection

- ◆ Visible fracture of isolating knife

In front of the cabinet, there is a visible window of the isolation fracture, which can be used to view the isolation closing position, isolation separation position, grounding closing position, and the three working positions. It is convenient for the on-site staff to repair and determine the location of the isolation knife, which is very safe.

- ◆ Pressure relief design

Internal arcing pressure valve: when arcing occurs inside the product, the pressure will be released from the pressure relief valve and the arcing will be discharged to the cable trench to avoid accidental injury to the operator.

- ◆ Green and environmental protection

It is designed with environment-friendly materials. SF6 gas is not used as the arc extinguishing medium and insulation. It does not pollute the environment. The primary circuit uses the least contact design to ensure low energy consumption during operation.

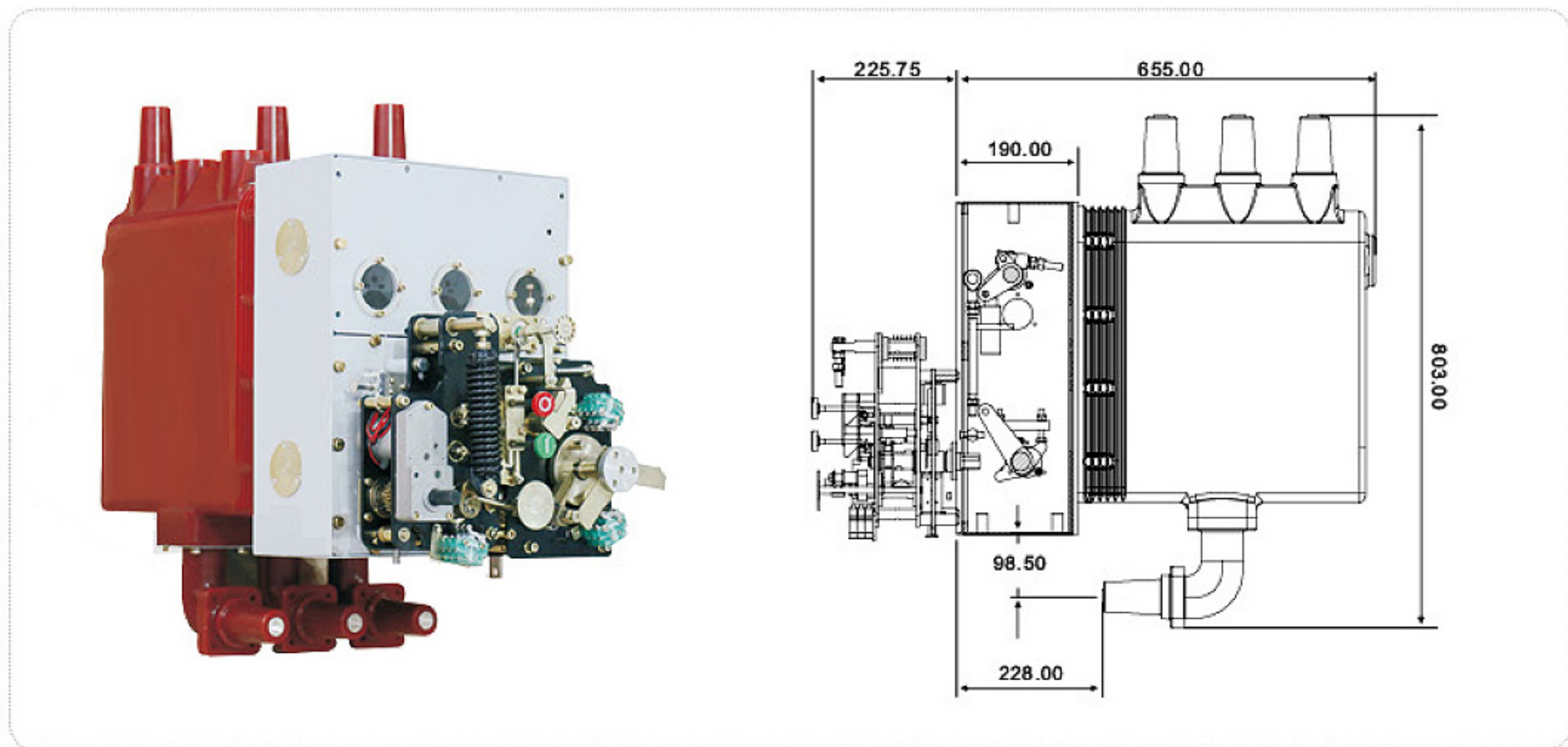


#### application area

- ◇ Low temperature and cold area: no SF6 gas application, no need to consider the low temperature operation of SF6 gas, and it can also operate normally at -45°C.
- ◇ Plateau area: it is unnecessary to consider the influence of plateau atmospheric pressure on insulation performance.
- ◇ Strong sandstorm area: the safety protection grade of solid insulation ring network cabinet body is IP67, and the control circuit room adopts special treatment to ensure long-term operation in strong sandstorm area.
- ◇ Coastal humid areas: epoxy resin sealing, moisture resistance, salt spray corrosion resistance, to ensure long-term use in coastal areas.
- ◇ Areas with high environmental protection requirements: the influence of SF6 gas on atmospheric warming has been paid great attention. The solid ring network cabinet has eliminated SF6 gas, which will not cause any pollution and harm to the environment and people.
- ◇ In the smart grid: since the main switches can be electrically operated, the intelligent controller produced by our company can be selected to remotely control, telemetering and tele signaling the switchgear and the substation site, which can be both decentralized and centralized.

#### 产品结构、工作原理 Product structure and working principle

固体绝缘环网柜机芯结构如图示 The movement structure of solid insulation ring network cabinet is shown in the figure



#### Structure characteristics of solid insulation ring network cabinet

##### Vacuum arc extinguishing chamber

The vacuum circuit breaker has the capability of breaking short circuit current, and is used for overload and short circuit protection of circuits and electrical equipment. Because of its small contact opening distance, short arcing time, slight burns when the contact breaks the fault current, small operating energy required, fast action and other characteristics, it also has the advantages of small size, light weight, small maintenance workload, fire prevention, explosion protection, and low operating noise. It is an ideal circuit breaker to replace oil circuit breakers and SF6 circuit breakers, and is widely used in high-frequency heating and other power distribution systems in electric power, metallurgy, telecommunications and other industries. Vacuum interrupter for circuit breaker is the key component of vacuum circuit breaker and the heart of vacuum circuit breaker, which basically determines the main performance of circuit breaker.

##### Solid insulation system

The current carrying conductors, such as vacuum interrupter and upper and lower outlet sockets, are packaged into a whole by using the fixed sealing pole formed by APG process. The disconnecter is installed in the cavity of the fixed sealing pole, so that the interphase insulation is mainly solid insulation. The design of single phase to phase insulated bus prevents the occurrence of serious faults between phases and to ground. The bus can be expanded to achieve unlimited expansion of functional units.

##### Three position knife switch

All switch cabinets are equipped with three position knife switches. The three position knife switch and the main switch are built in the solid sealing pole together. Three phase linkage, which can be operated to achieve three positions: working/isolation/ grounding. Mechanical interlocking is adopted with the main switch. Only when the main switch is in the opening position, the three position knife switch can act.

##### Operating mechanism

The operating mechanism of the circuit breaker is a spring operating mechanism, which has the characteristics of simple structure, reliable action, compact size, maintenance free, etc. The closing power can be adjusted up and down according to the user's requirements. The mechanism can be used for manual energy storage, manual closing, manual opening, or electric energy storage, electric opening and closing, which is convenient for the user's operation.

The three position knife switch operating mechanism adopts the design of over center spring, which can be quickly opened and closed. It has the function of breaking and closing a certain load current. In addition to manual operation, the three position mechanism can also be electrically operated, which can realize intelligent remote control isolation and grounding, greatly facilitating the use of users.

The solid insulation ring network cabinet is a small GIS switchgear, and its structure is as follows:

- The high-voltage load switch and high-voltage live parts are sealed in the epoxy plastic insulation sleeve shell without any gas. The vacuum arc extinguishing chamber is small in size and reliable in arc extinguishing. The load switch is equipped with a grounding switch, which has three positions of closing, opening and grounding, and has the function of grounding knife and isolating knife.
- It can be combined at will. Each unit is led out through three high-voltage bushings, and the cable connection is convenient.
- The sealing box made of imported materials is adopted, and strict sealing measures are taken at the connection of the operating mechanism and the high-pressure bushing, with good performance.
- High voltage bushing and high voltage insulating cylinder made of imported epoxy resin by APG process are assembled by silicon rubber sleeve fitting between the insulating cylinder and the high voltage bushing, which has a good sealing effect.
- Each circuit is equipped with a mutually independent operating mechanism, which is installed on the front of the cabinet and has a variety of mechanical interlocking functions.

- f. The load switch and grounding switch are equipped with spring operating mechanism. The load switch can be manually or electrically operated. The grounding switch has not only grounding effect but also isolation effect. It can only be manually operated.
- g. The circuit breaker can be equipped with permanent magnet operating mechanism, which can be electrically closed and opened, and can be manually opened, but cannot be manually closed. The circuit breaker can also be equipped with a spring mechanism, which can be either manual or electric. The distribution automation interface is reserved.
- h. There is a visual window on the ring main unit panel, which can directly observe the opening and closing state of the disconnector fracture, and there is an obvious disconnection point.
- i. Each ring network cabinet unit is composed of three separate insulating cylinders in parallel, which is easy to install and replace. The biggest advantage is that the interphase discharge is avoided.
- j. The main components of the solid insulation fully enclosed ring network cabinet are composed of an insulating cylinder and a vacuum arc extinguishing chamber.
- k. The solid insulating material is imported epoxy plastic resin with a thickness of no less than 10mm, which has strong corrosion resistance and high insulation capacity. The internal space is greater than 150mm. The phases are separated separately and connected together through the base plate mounting frame. The combination is flexible, the structure is simple, reasonable and beautiful.
- l. There is no fastener on the surface of the box for disassembly, which has good anti-theft property. The box has a protection grade of IP33 and good rain proof performance.
- m. The top cover is provided with a vent, the air inlet is at the lower part of the box, and a dust-proof filter screen is provided. The air outlet is located at the top of the box, and is hidden under the eaves to form air convection from bottom to top, so that the box has good heat insulation and ventilation effects. The top cover is provided with a drainage angle of a certain angle.
- n. The box has a sealed floor with cable inlet to prevent moisture in the cable trench from entering the box.
- o. The door is sealed with sealing strip, and the door lock is rainproof structure. When the door is opened, the limit pull rod makes it easy to fix the door.
- p. The switch in the box is a solid insulation fully sealed structure, which does not need a heater. The cable head can be divided into touchable and non touchable types according to user requirements, and is not afraid of water immersion.

**Operating mechanism and operation**

a. Each load switch and grounding switch in the ring network unit are equipped with independent spring operating mechanism, which is installed on the front panel of the cabinet and can be manually or electrically operated. Each circuit of the panel is equipped with two operation holes to operate load switch and grounding switch respectively. Vacuum circuit breaker is equipped with integrated permanent magnet operating mechanism and spring operating mechanism.

**b. Operating instructions of load switch**

**Power transmission operation**

First close the isolating grounding switch: insert the operating handle into the grounding operation hole (when the isolating knife is in the grounding closing state), rotate it anticlockwise to open the grounding switch, then insert the operating handle into the isolating operation hole, rotate it anticlockwise to close the isolating knife. Re closing the load switch: insert the operating handle into the operating hole of the main switch, turn it counterclockwise for about 2 turns, and the main switch is closed.

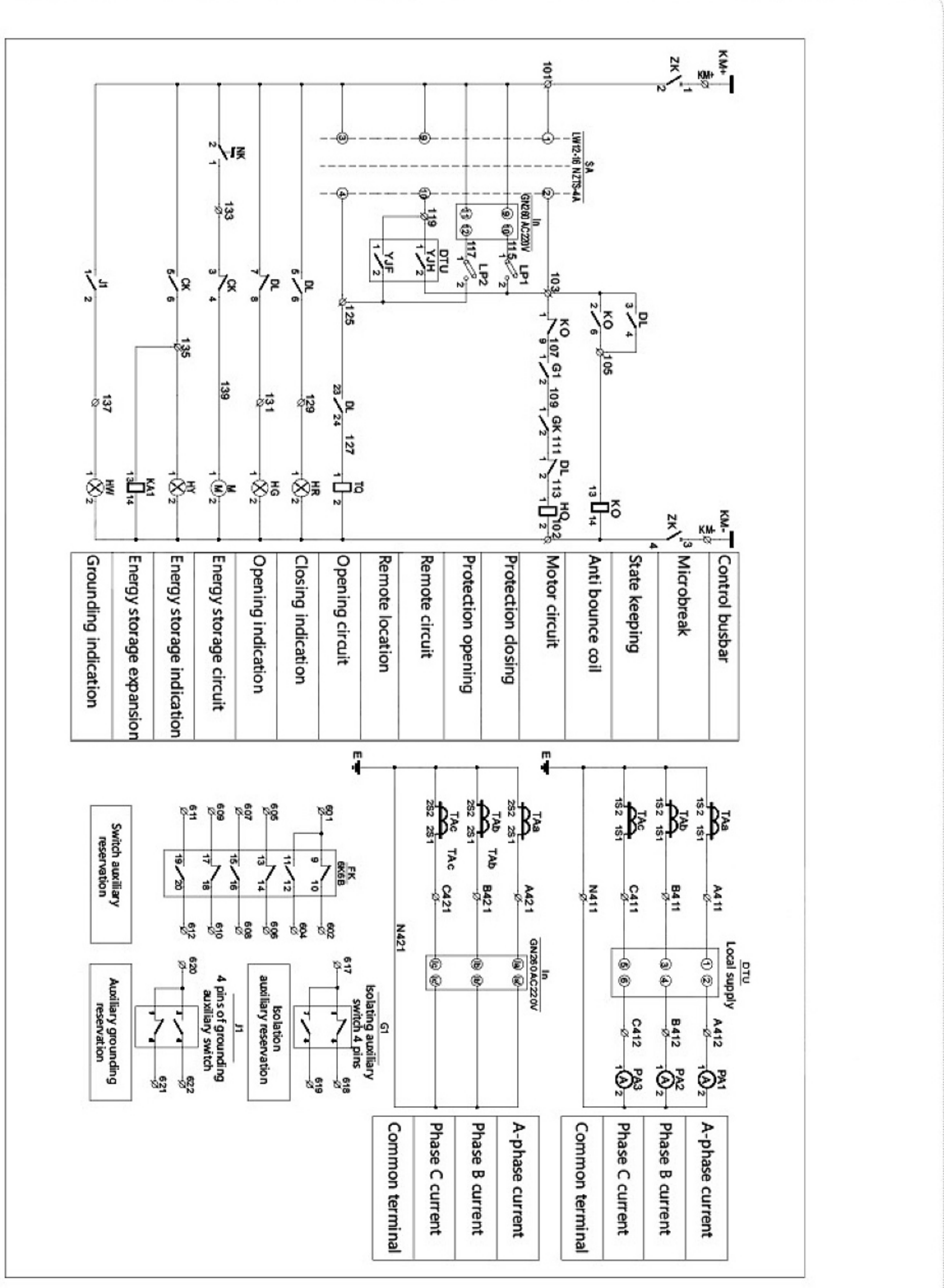
**Power failure operation**

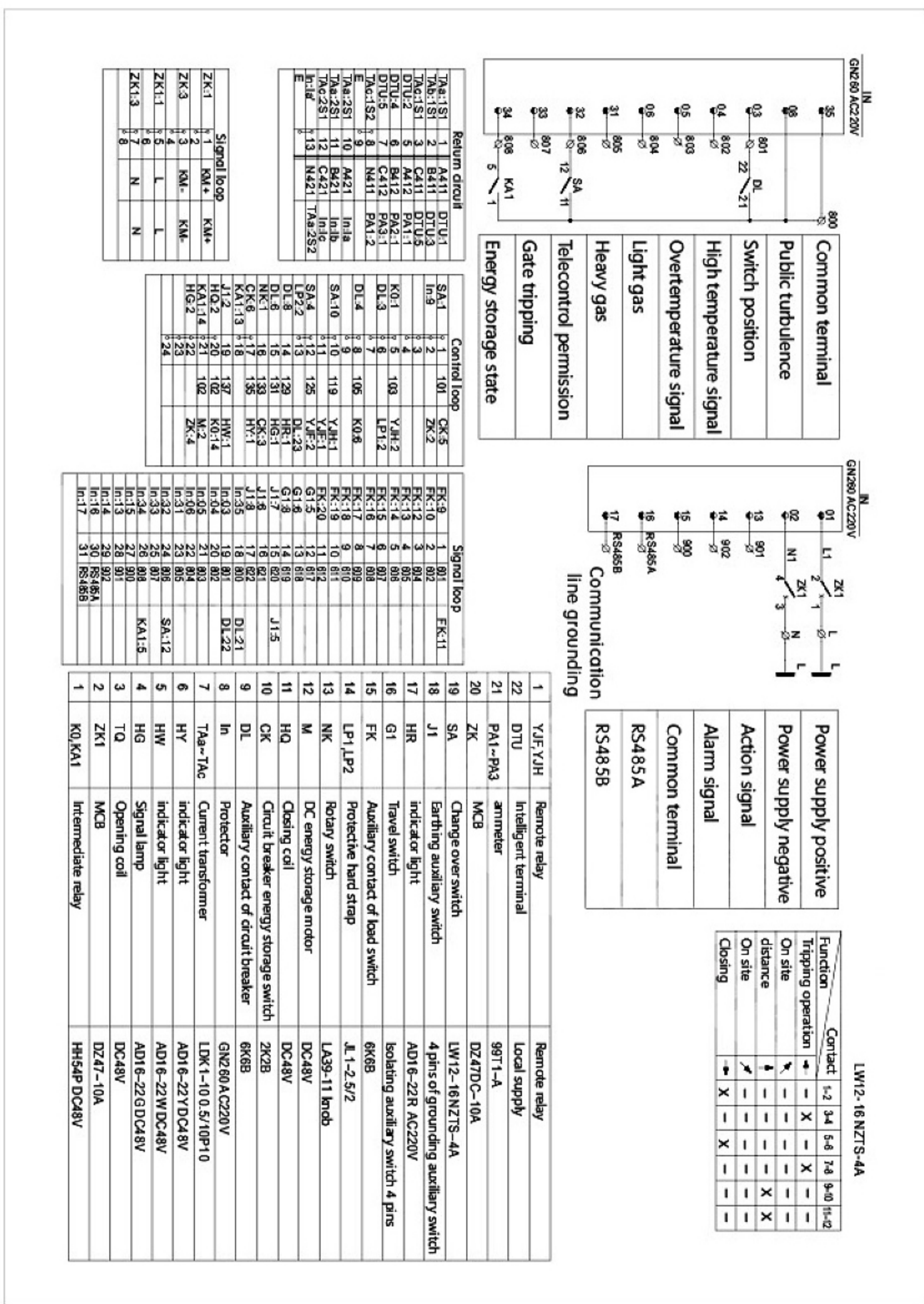
Turn off the load switch first: turn the opening knob counterclockwise to open the switch. Then disconnect the isolating grounding switch: insert the operating handle into the operating hole of the isolating mechanism, rotate clockwise to separate the isolating knife, and insert the operating handle into the grounding operating hole, rotate clockwise to close the grounding.

**e. Installation and replacement of fuse**

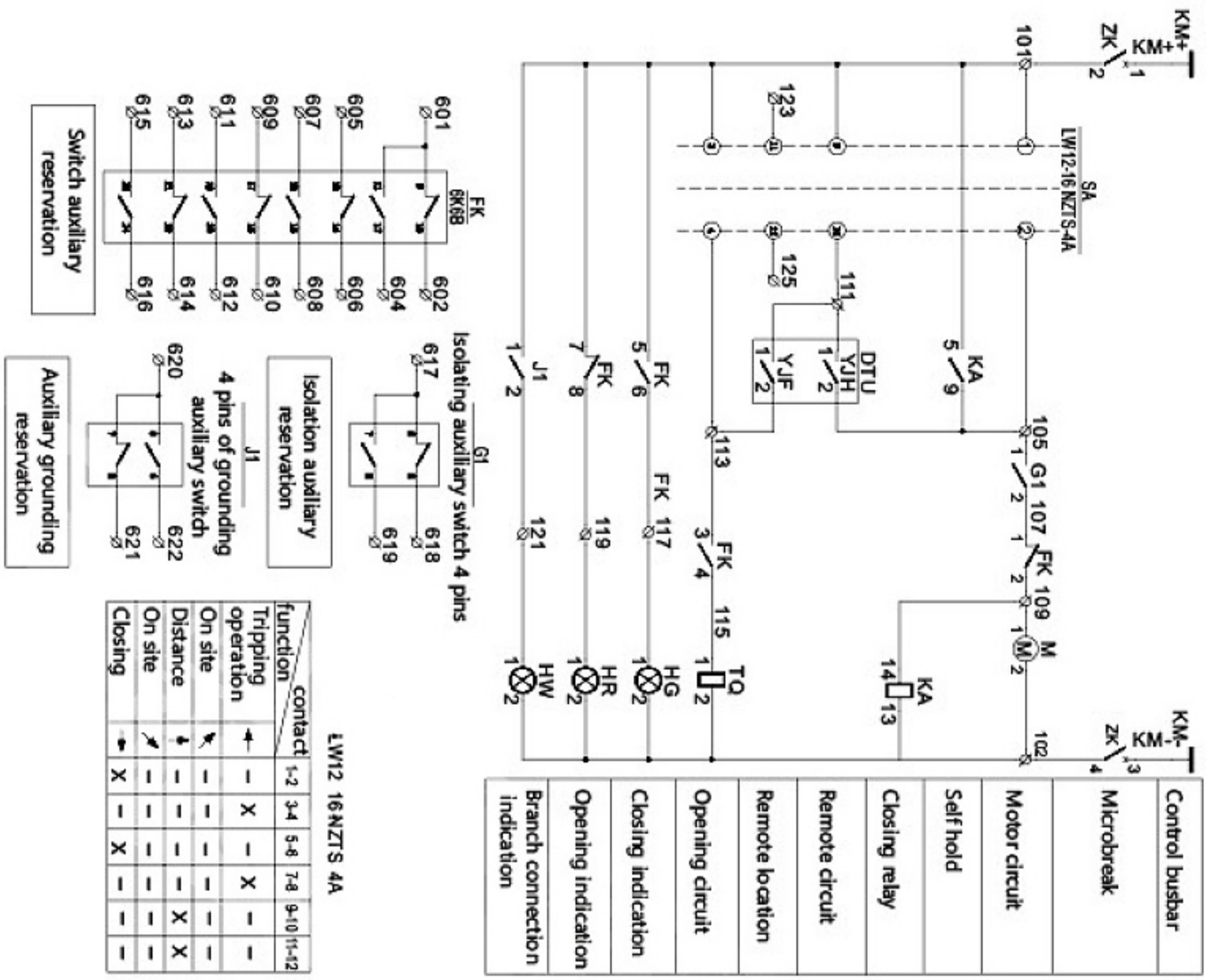
- (1) First close the grounding switch.
- (2) Lift the operating handle and rotate it counterclockwise to make the pin out of the slot
- (3) Install the striker mechanism into the fuse barrel, make the pin in the slot, rotate clockwise to make the operating handle parallel to the panel, and then press down the handle with force.
- (4) Only when the load switch is grounded can it be opened.

**Secondary diagram of solid circuit breaker**

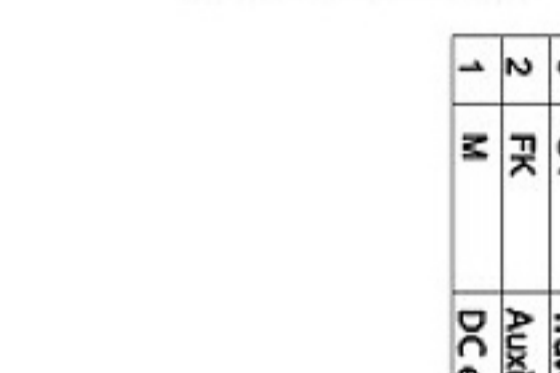
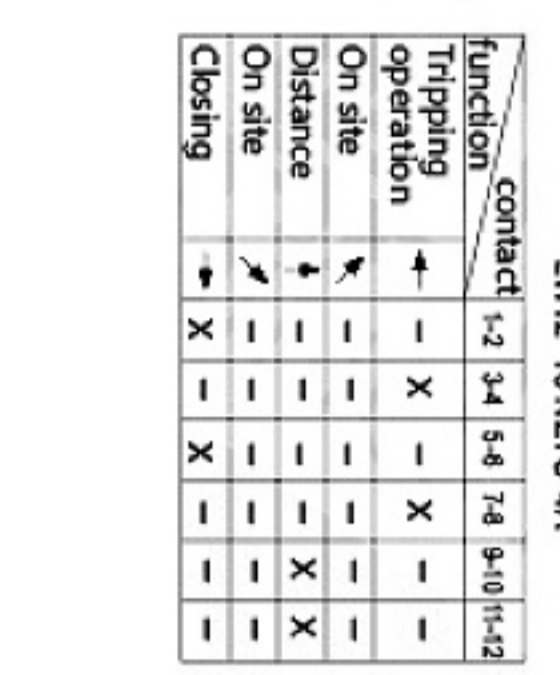
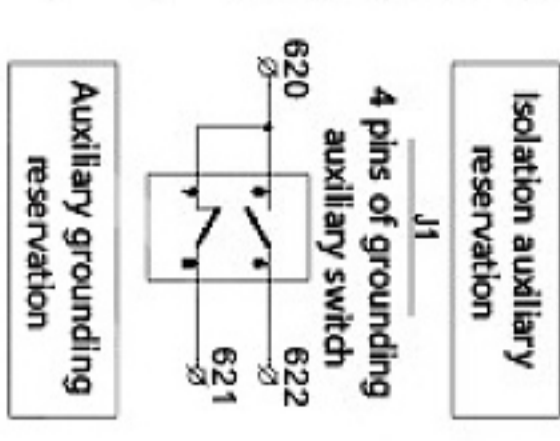




Terminal strip description: distinguish between current and voltage terminals. The current loop uses 2.5 square meters and the voltage loop uses 1.5 square meters

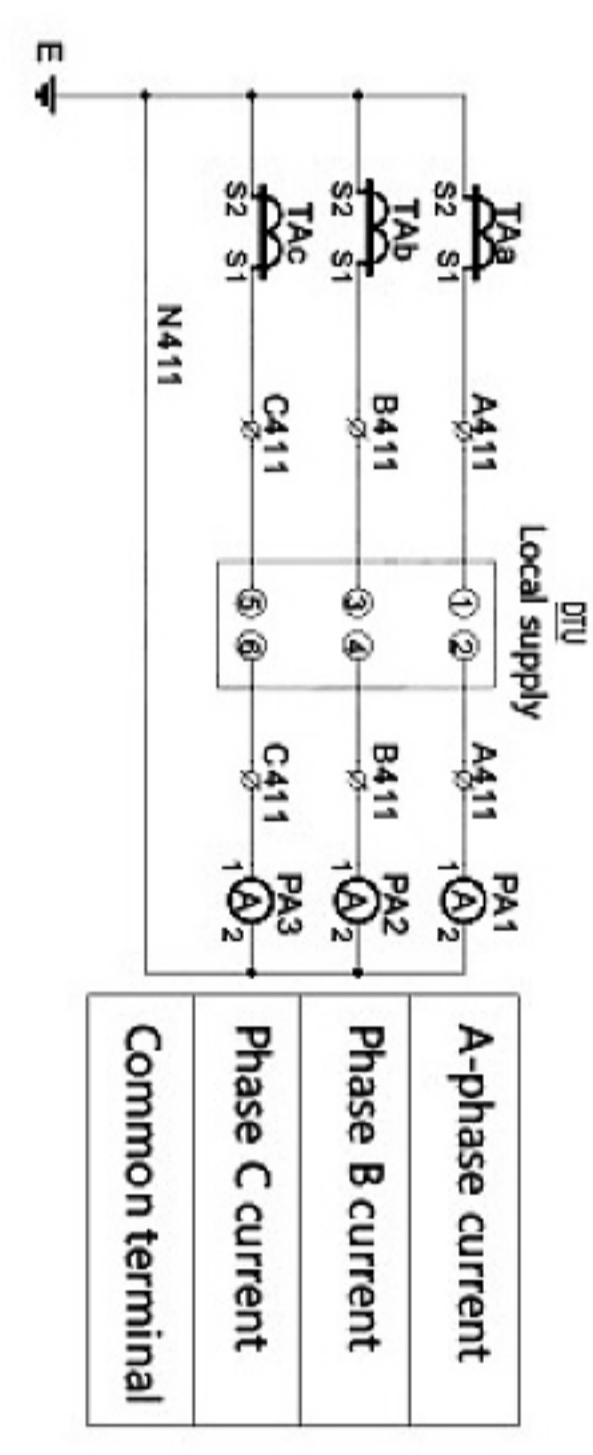


Control busbar	102
Microbreak	105
Motor circuit	109
Selfhold	14
Closing relay	KA
Remote circuit	DTU
Remote location	YJH, YJF
Opening circuit	HR, HW, TQ
Closing indication	FK
Opening indication	FK
Branch connection indication	J1, G1

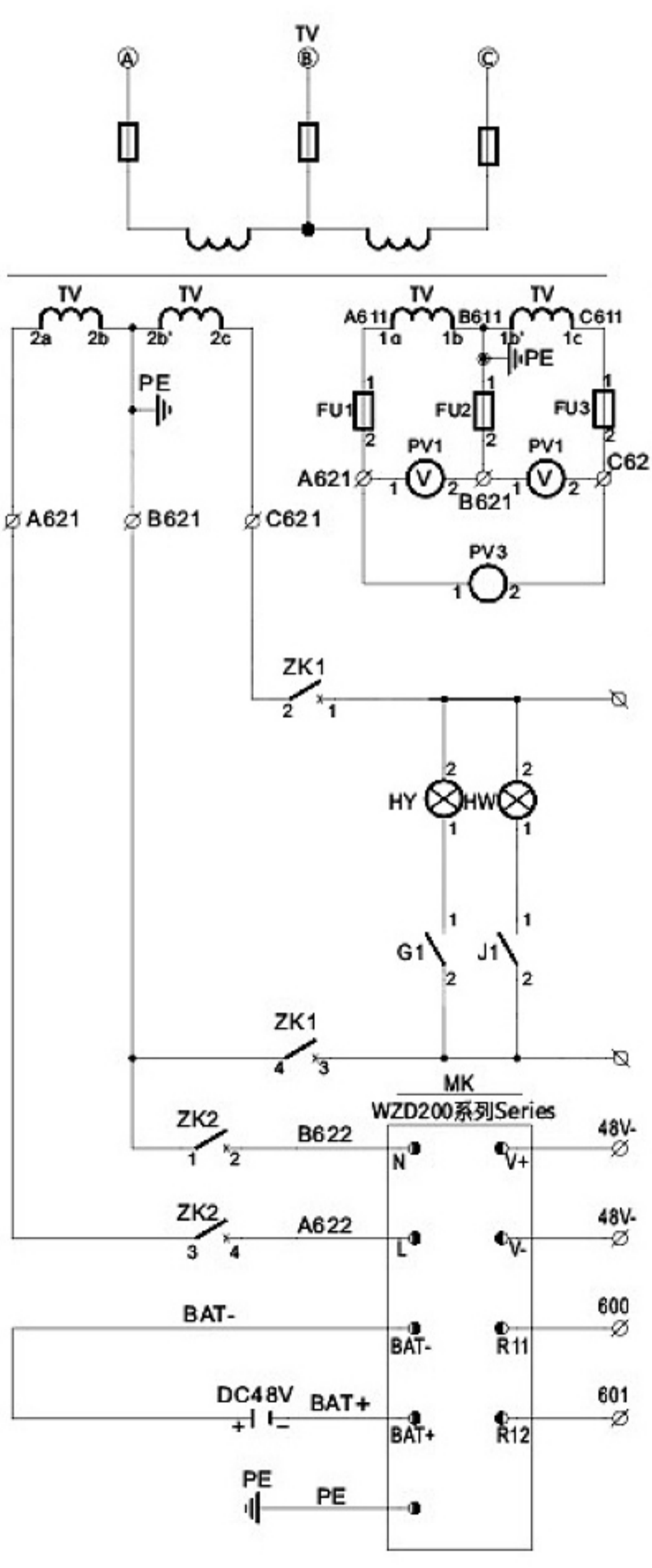


function	contact	1-2	3-4	5-6	7-8	9-10	11-12
Tripping operation	+	-	X	-	-	-	-
On site	+	-	-	-	-	-	-
Distance	+	-	-	-	-	-	X
On site	+	-	-	-	-	-	X
Closing	+	X	-	-	-	-	-

1	YJF, YJH	Remote relay	Remote relay
14	DTU	Intelligent terminal	Local supply
13	PA1-PA3	ammeter	99T1-A
12	TAa-TAc	Current transformer	LDK1-10 Grade 0.5
11	ZK	MCB	DZ47DC-10A
10	SA	Change over switch	LWT2-16 NZTS-4A
9	J1	Earthing auxiliary switch	4 pins of grounding auxiliary switch
8	HW	Indicator light	AD16-22W AC220V
7	HR	Indicator light	AD16-22R AC220V
6	HG	Indicator light	AD16-22G AC220V
5	TQ	Opening coil	DC220V
4	KA	Intermediate relay	HH54P DC220V
3	G1	Travel switch	Isolating auxiliary switch 4 pins
2	FK	Auxiliary contact of load switch	6K68
1	M	DC energy storage motor	DC220V



A411	PA1
B411	PA2
C411	PA3
N411	



一次回路  
Primary circuit

电压测量  
Voltage measurement

AC220V输出  
AC220V output

DC48V输出  
DC48V output

报警出口  
Alarm exit

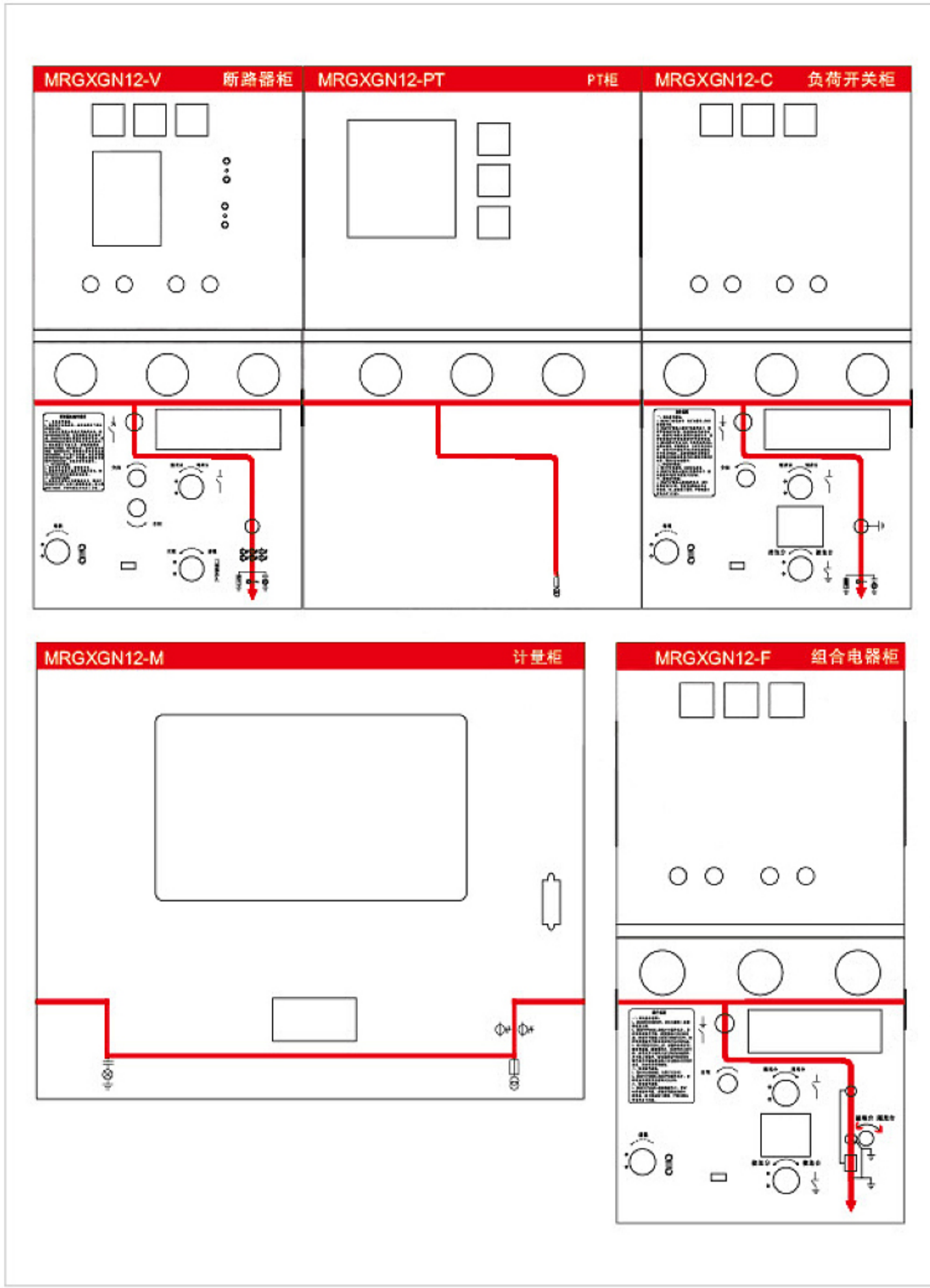
装置接地  
Device grounding

电压回路 Voltage circuit		
FU1:2	1	A612 PV1:1
	2	
FU2:2	3	B612 PV2:1
	4	
FU3:2	5	C612 PV3:2
	6	
ZK2:3	7	A621 TV:2a
	8	
ZK2:1	9	B621 TV:2B'
	10	
TV:2C	11	C621 ZK1:2
	12	
ZK1:1	13	L
	14	
ZK1:3	15	N
	16	
MK:L	17	A622 ZK2:4
MK:N	18	B622 ZK2:2
DC48V:+	19	BAT+ MK:BAT+
DC48V:-	20	BAT- MK:BAT-
MK:V+	21	48V+
	22	
MK:V-	23	48V-
	24	
MK:R11	25	600
MK:R12	26	601

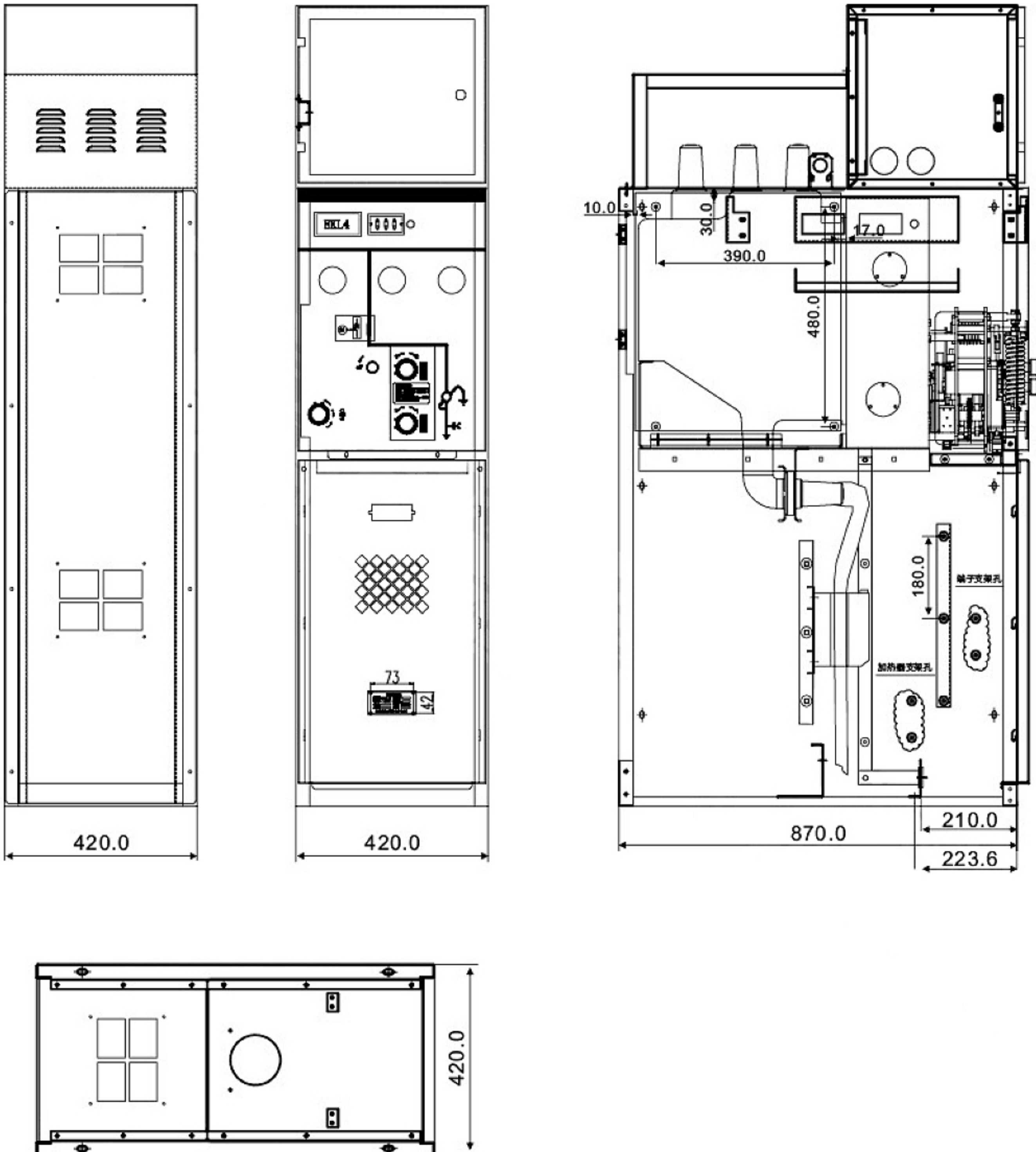
Technical description:

1. The voltage circuit uses 1.5 square flexible wire, voltage from entering the secondary circuit in series.
2. The power supply of incoming and outgoing line control circuit is incorporated from the terminal of PT cabinet, and 1.5 square flexible wire is used;
3. Short circuit at PT secondary side is strictly prohibited. Phase B groups are grounded independently to prevent the primary

## 设计方案 design scheme



## 设计方案 design scheme





## 产品外观展示 Product appearance display

户内型环网单元的柜体结构如图示 Cabinet structure of indoor ring network unit is shown in the figure



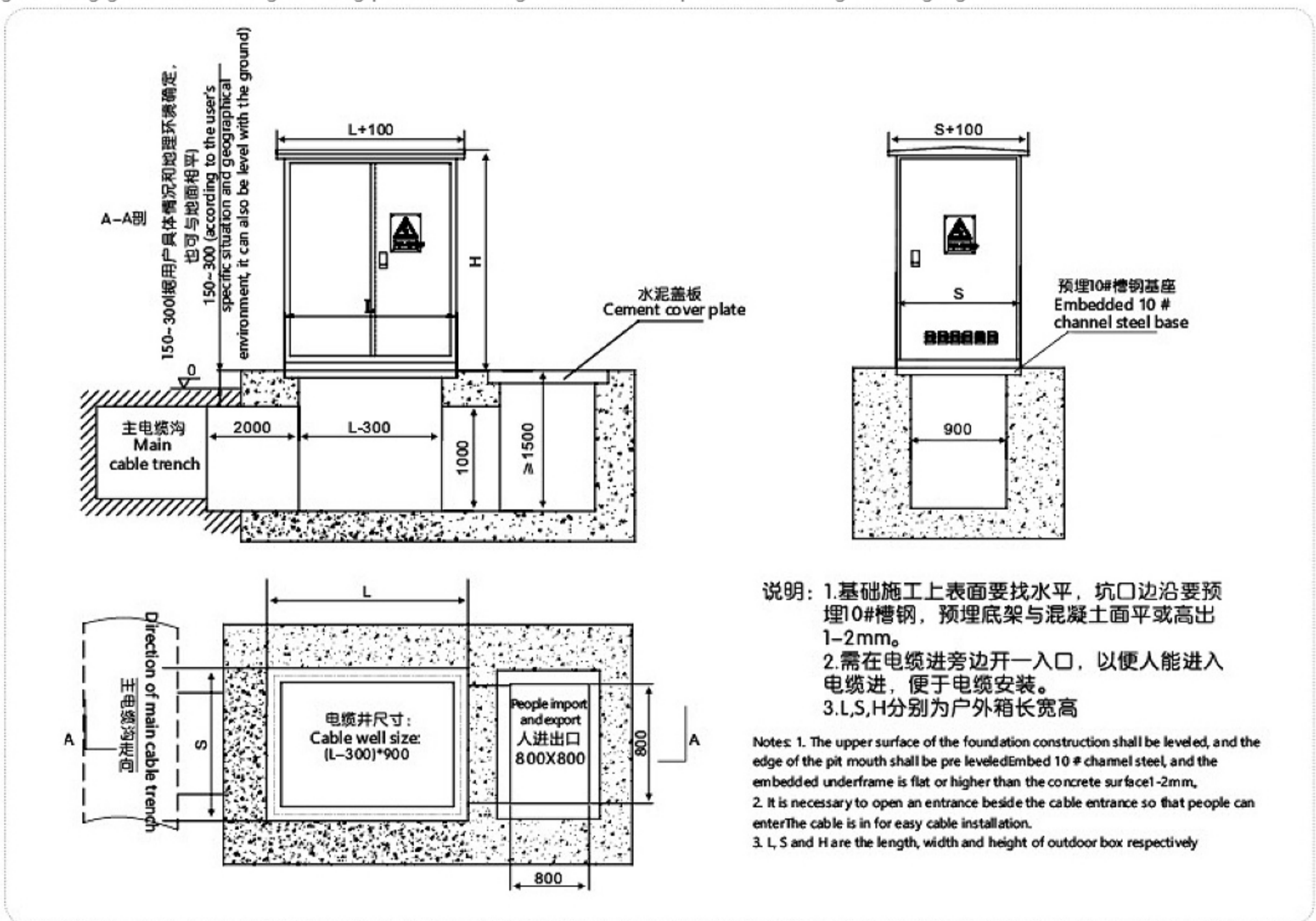
户外型环网单元的柜体结构如图示 The cabinet structure of outdoor ring network unit is shown in the figure



### Foundation drawing

install

The ring network unit shall be installed in a well ventilated place. It shall be operated and maintained at the front. The base of the ring network unit is provided with anchor mounting holes. The indoor cabinet can be installed away from or against the wall. The installation position is shown in the figure. The flatness of the track laid on the installation foundation shall not exceed 2mm per square meter. The base of the ring network unit must be fixed on the foundation. During outdoor installation, the foundation shall be built at a higher terrain, and the distance from the surrounding area to the wall or shelter shall not be less than 1 m, so as not to obstruct the door opening. The pit wall is made of cement and solid bricks, and the surface is treated against seepage. The thickness of 1:2.5 cement mortar used for pit wall and foundation platform is 20mm, and the surface must be flat. Concrete shall be made in accordance with GB232-82 Code for Construction and Acceptance of Electrical Equipment Installation Engineering. After cable installation, the bottom plate of cable chamber shall be sealed to prevent moisture from entering the trench. The connection of the ring network unit must be connected to the grounding grid on site. The grounding point of the ring network unit is provided with a grounding sign.



### Transportation and storage

The packaged ring network unit can be transported by electric forklift or crane. The ring network unit is equipped with lifting rings for lifting during transportation. Lifting rope

The ring network unit shall be placed in a dry, ventilated and dust-free place before installation on site. If covered with plastic bags, the bottom should be open for ventilation.

### Use and maintenance

- ◆ Inspection before use: Before using the ring network unit, the following inspections must be carried out for personal and equipment safety
  - ◇ Check whether the main circuit and the grounding circuit are correctly connected.
  - ◇ Check whether the mechanical interlocking is correct and reliable.
  - ◇ Check whether the operation of load switch and grounding switch in the ring network unit is flexible and correct.
  - ◇ Check whether the high-voltage cable is connected correctly and reliably.
- ◆ Run
  - ◇ The ring network unit shall be put into operation according to the specified operation sequence.
- ◆ Maintenance: based on the following advantages, this equipment does not need routine maintenance
  - ◇ All live parts shall be installed in the epoxy plastic resin insulating cylinder.
  - ◇ All operating mechanism parts placed outside the epoxy resin insulating cylinder have been plated.
  - ◇ The main shaft is supported by a copper bushing, which can work continuously and effectively even without adding lubricant.

Note: If the ring network unit is faulty, do not attempt to open the ring network unit with a drill, cutter or other tools for repair. These operations can only be carried out by the company's personnel.

### Attached documents and attachments

- ◆ When the product leaves the factory, the following data and accessories shall be provided:
  - ◇ Product installation and operation manual.
  - ◇ Product delivery test report.
  - ◇ Product qualification certificate.
  - ◇ Packing list.
  - ◇ Operating handle.
  - ◇ Other attachments.