



Outline

RM6-12/24 Gas Insulated Ring Main Unit Switchgear adopts modular design, which fits the requirement of end user or network node by relying on perfect combination of fixed and flexible expansion. It also meets the demand of various distribution switching stations, box-type substation and cable branch boxes. It has characteristics of compact structure, safe, reliable, long life and free maintenance.

The switchgear includes an air tank welded by 3.0mm stainless steel, all live parts and switches are placed in it.

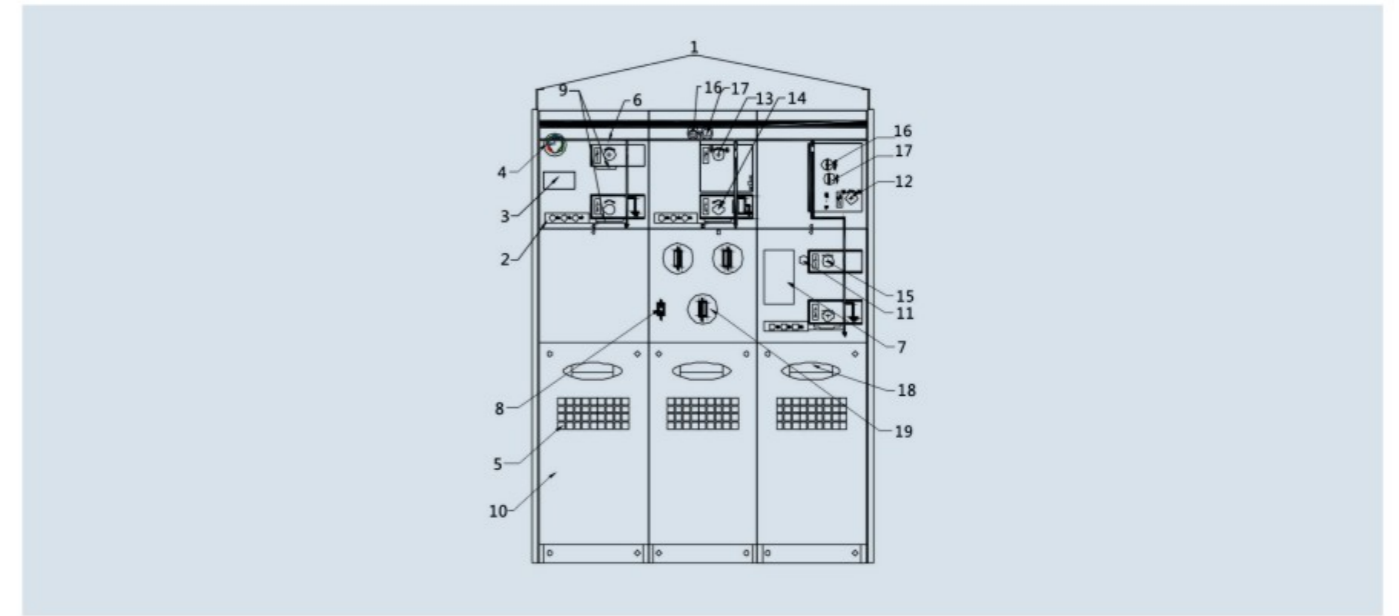
Routine test shall be carried out for all elements/modules before the product leaves the factory. These elements/modules can be installed after delivery, and any special tool is not required.

Available module

- ◆ C Load break switch module
- ◆ De Cable connection module with earthing switch
- ◆ D Cable connection module without earthing switch
- ◆ F Load switch-fuse-combination unit module
- ◆ V Vacuum circuit breaker
- ◆ Be Bus ground module
- ◆ M Meter module
- ◆ SL Bus section switch module (load switch)
- ◆ Sv Bus section switch module (vacuum circuit breaker)

Structural drawing of switchgear

1. Ring
2. Voltage indicator
3. Cable failure indicator
4. Pressure indicator
5. Observation window for lower door
6. Analog circuit diagram
7. Integrated protection
8. Blown fuse indicator
9. Padlock device on the panel
10. Cover plate of cable chamber
11. Key lock(accessory)
12. Energy storage handle hole of circuit breaker
13. Load break switch handle hole(F unit energy storage)
14. Earthing switch handle hole
15. Isolating switch handle hole
16. Opening button(knob)
17. Closing button(knob)
18. Handle of cover plate of cable plate
19. Fuse room



Main technical parameters

S/N	Name	Unit	Parameter		
			Load switch cabinet	Combined switchgear	Circuit breaker cabinet
1	Rated voltage	kV	12/24		
2	Rated current	A	630	125	630/1250
3	Rated short-time withstand current	kA/s	20/3,25/2	/	20/4,25/4,31.5/4
4	Rated peak withstand current	kA	50,63	/	50,63,80
5	Rated short-circuit breaking current	kA	/	31.5	20,25,31.5
6	Rated short-circuit closing current	kA	50,63	80	50,63,80
7	Rated transfer current	A	630	1700	/
8	Rated closed loop breaking current	A	100	/	/
9	Full capacity breaking times	times	5000	/	30
10	Mechanical life	times		5000	10000
11	1min power frequency withstand voltage/ phase to phase,to earth	kV	42/50		
12	1min power frequency withstand voltage/ Isolation fracture	kV	48/58		
13	Rated lightning impulse withstand voltage/ phase to phase,to ground	kV	75/125		
14	Rated lightning impulse withstand voltage/ Isolation fracture	kV	85/125		
15	Two circuit 1min power frequency withstand voltage	kV	2		

Note

- ◆ Brick wall M5 cement mortar bricking, interior and outer edge on the ground are plastered by 1:2.5 cement sand;
- ◆ Waterproofing work shall be carried out for the ground floor below under ground water level, otherwise water seepage treatment shall be carried out.
- ◆ Lintel is made by Φ6 reinforcing steel bar and concrete 20;
- ◆ Preservative treatment shall be carried out after 8# box iron foundation bed is installed and welded (the user shall determine preservation way);
- ◆ Foundation notch can be placed for 8# box iron foundation bed, and fixed by lacing wire and concrete.
- ◆ Users can made cable well according to specific condition at construction site (dashed box)
- ◆ a denotes the width mm of foundation of outdoor box, b denotes the depth mm of foundation of outdoor box. The specific size of outdoor box is determined according to actual design condition.

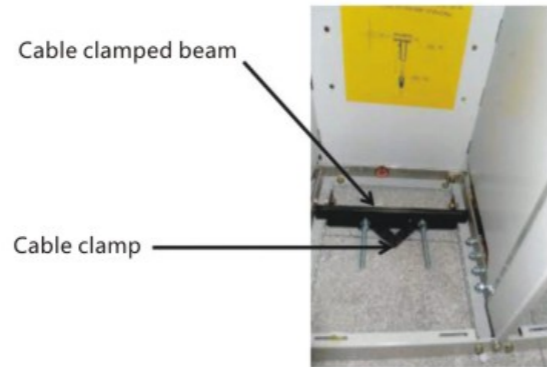
Cable chamber

When the twitchgear is installed indoors

Remove the cover of cable chamber. Attention! The cover can be interlocked with earthing switch. When mutual interlocking gear is equipped, it can enter the cable chamber only earthing switch is in closing position.



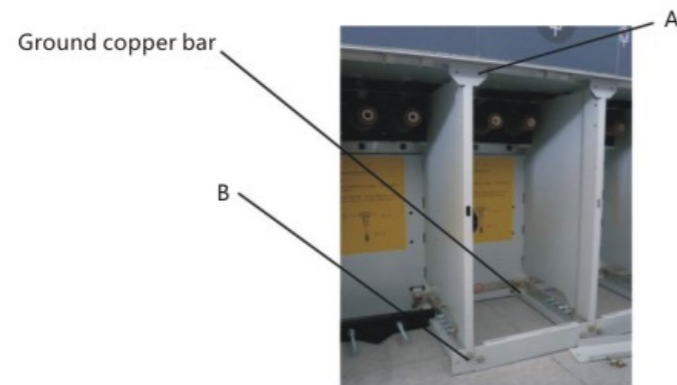
Loosen the screw of cover plate of cable chamber, take out the cover plate and remove



Remove head damper.



After head damper is removed



Loosen A and B to remove the clapboard.

Cable connection

Switchgear is equipped with external casing pipe, the height from all casing pipes to the ground, and is controlled by the cover plate of cable chamber.

Installation must be carried out according to manufacturer's installation instruction. Silicon grease must be used to lubricate casing pipe fully.

Attention!

Earthing switch must be locked in closing position or casing pipe must be put with insulated cap before cable is not connected and the unit is put into operation.

Installation of current transformer for relay protection

Install current transformer. Cable shield is returned and earthed by centre hole.

Keep relay is installed at each vacuum switch module, and the cable from keep relay to current transformer is placed in the cable chamber to prepare to connect three-phase current transformer.

Before installation

Check three-phase current transformer arrives or not, and they are the same type.

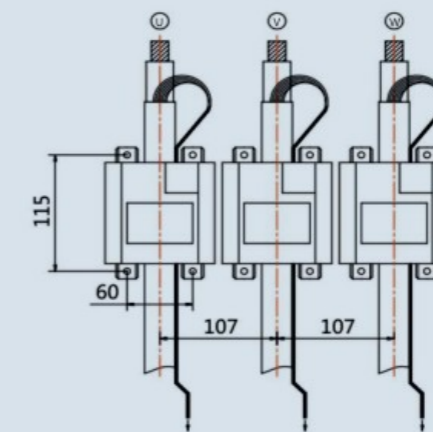
Check the type of current transformer is correct, rated current of transformer, adjustment range of keep relay and transformation ratio of instrument transformer. (See Keep Relay Manual)

Before assembling cable connector, all current transformers must be assembled to high voltage cable. Earth shield on the cable must be returned by central hole of current transformer (see right figure), and earthed by earthing bar in the cable chamber. The mounting plate of current transformer shall be assembled in the cable chamber.

Current transformer shall be connected with the cable of keep relay after installation. For the description of connection, refer to User Manual offered together with keep relay.

RM6-12 Vacuum circuit breaker supports two types of keep relays: self-powered digital relay and microprocessor protection monitor.

Specialized manual is prepared for each type of keep relay, followed by adjustment cases. Correct connection of current transformer and proper adjustment of keep relay are basic requirement of playing correct function.



Earth screen on the cable is returned and earthed by centre hole

Gas pressure

The rated absolute pressure of SF6 gas in the airtank of switchgear is 1.4bar. under 20°C. The Switchgear is permanently sealed, and equipped with a gas gauge to indicate the pressure. When the pointer is in green area 1.2~1.4bar (20°C), indicating the equipment pressure is normal.

Operation

Operation condition

Normal environment condition

Switchgear operates under normal condition, which is in accordance with: IEC62271-200.

The specific limit is as follows:

Environment temperature	Temperature	Maximum average relative humidity	
Max temperature	+40°C	24 hours measurement	≤95%
Min temperature	-40°C	1 month measurement	≤95%

Under the condition that does not lower gas pressure:

Maximum altitude: 3000m

Special condition

The manufacturer must reach a consensus with final user for special operation condition that is different from normal operation. If poor operating environment is involved, consult the manufacturer and supplier.

For example: when electrical equipment is installed at above 3000m altitude, barometric pressure will reduce, thus overpressure in the switchgear must be eliminated.

Switchgear operation

All switches must be operated by using the handle.

Internal mechanical interlock between load switch/vacuum switch and the corresponding switch can prevent faulty operation.

The operation between load switch/vacuum switch and the corresponding earthing switch can be interlocked further by padlock.

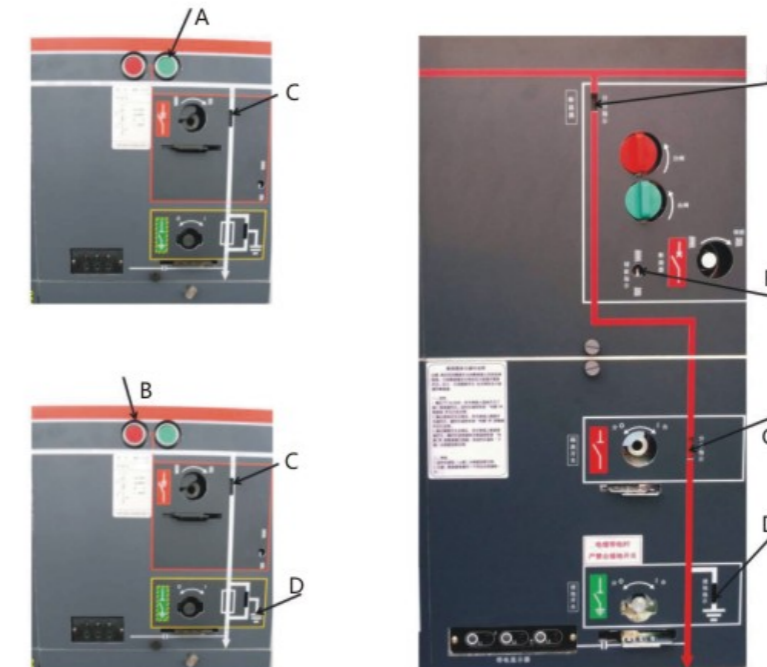
Earthing switch can be operated by a quick-mechanism to make sure quick closing.

Rotate clockwise the handle to close earthing switch. Rotate the handle counterclockwise to separate the earthing switch.

The spring must be stored with energy when closing load switch-fuse-combination unit or breaker switch. Rotate the operating handle clockwise, the energy storage is in place, then green closing knob/knob on the operation mechanism following the direction of arrow must be pressed to close switch/breaker.



Load switch	Earthing switch	Load switch-fuse-combination unit
<p>Closing: rotate clockwise the operating handle</p>	<p>Closing: rotate clockwise the operating handle</p>	<p>Closing: rotate clockwise the operating handle to store energy for "opening/closing" spring, then closing: press green knob. (A)</p>
<p>Opening: rotate counterclockwise the operating handle</p>	<p>Opening: rotate counterclockwise the operating handle</p>	<p>Opening: press red knob. (B) If overcurrent and short circuit happen in load switch-fuse-combination unit, load switch will trip by firing pin triggered by fuse.</p>



Vacuum circuit breaker

Closing: Insert the handle into the operation hole of the circuit breaker, and rotate it clockwise continuously until a "crack" sound is heard, which means circuit breaker has been stored with energy (the motor will be stored with energy automatically when control circuit is electrified).

Manual or electric break circuit. For manual operation, rotate anticlockwise (lower end) closing button for closing; for electrical operation, press closing button on low-voltage switchgear for closing.

Opening: Rotate anticlockwise(upper end)opening button for opening;

It can operation closing and opening one time for each after the breaker is stored energy one time.

Isolating switch

Closing: rotate clockwise the operating handle

Opening: rotate counterclockwise the operating handle

Earthing switch

Closing: rotate clockwise the operating handle

Opening: rotate counterclockwise the operating handle

Mechanical position indication

C: Load switch-fuse-combination unit opening

D: Earthing switch opening

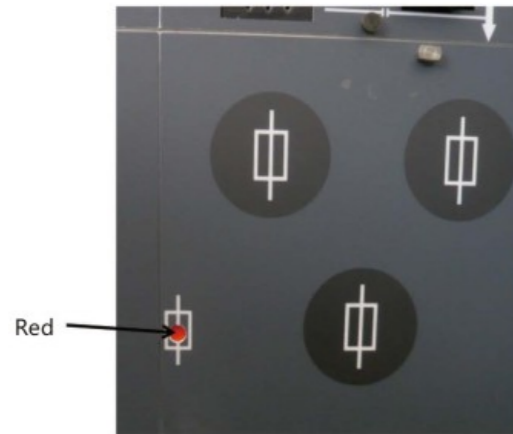
E: Breaker switch opening

F: Breaker energy storage

G: Isolating switch opening

Installation and change of the fuse

There is fuse status indicator on the panel in fuse room under the front panel, which indicates whether the fuse is tripping. The fuse replacement order is shown as below. Configuration of the load switch-fuse combination module does not pre-install the fuse.



①Fuses tripping indication.



②Rotate the operating handle clockwise to close the earthing switch



③Loosen the panel in fuse room.
④Incline the panel in fuse room, in order to operate fuse unit.



⑤Rotate counterclockwise with the operating handle to open the fuse unit.

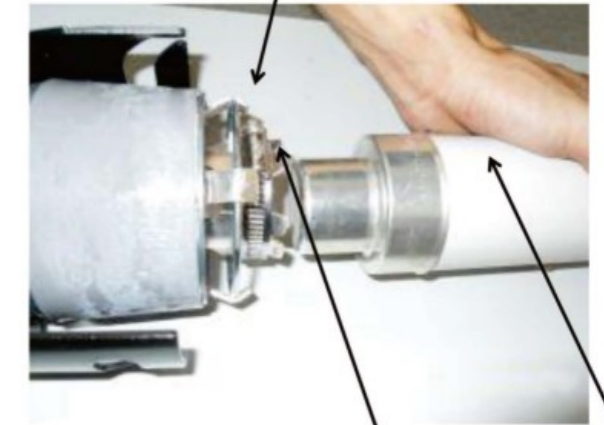


⑥Pull the handle of fuse unit. The fuse is fixed on the box cover of the fuse tightly.



⑦Replace the fault fuse with a new fuse. Fix the fuse on the cover of the fuse unit with a fastening screw. The firing pin must point to the outside so that the fuse can operate normally.

Tightly screw the fastening bolt on the clamp.



Firing pin Fuse

⑧Push the fuse into fuse unit horizontally, use the operating handle to rotate clockwise the upper handle on the cover of the fuse unit to close and seal the fuse unit.

⑨Close the panel in the fuse room. Disconnect the earthing switch, and the load switch can come into operation.

Shipment and transportation

These units can be installed easily after leaving the factory.
Weight table of assembly units of different modules for switchgear

- Standard 2-way DF/CF/260□
- Standard 3-way CCC/CCF/CFC/300□
- Standard 4-way CCCC/CCCF/CCFF/CCFC/CCVV/400□
- Standard 5-way CCCCC/CCFFF/CCVFF/CCCCF/520□
- Standard 6-way CCCCCCC/560□



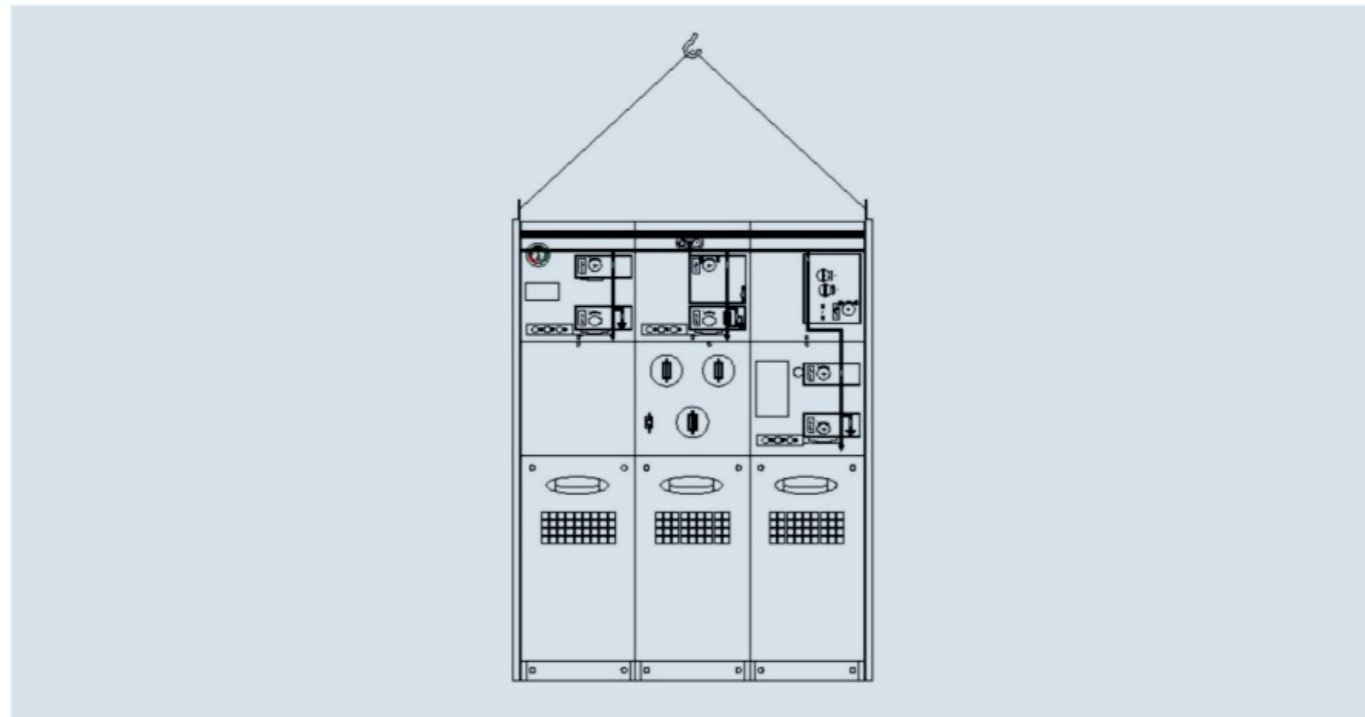
Switchgear is fitted with lifting rings for lifting, and it can be moved by using the shovel of the fork lifter.

Inspection tests

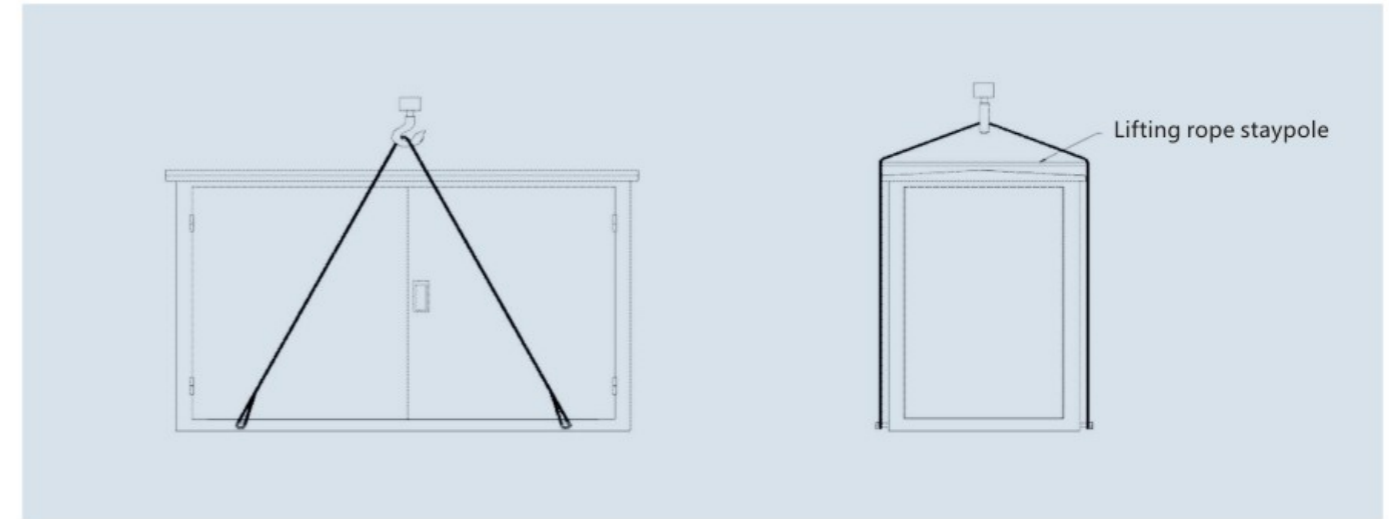
After receiving switchgear, please check if there is any damage during the transportation. If any, the carrier must be informed immediately. After unpacking, the following parts shall be checked:

- ◆ ONE operating handle must be included.
- ◆ The pointer in pressure indicator shall be in the green area.
- ◆ Carry out functional test for mechanical parts.
- ◆ Any defect and omission must be informed to the supplier immediately.

Switchgear hoisting schematic drawing



Hoisting schematic drawing of the switchgear with housing



Storage

Before the installation and use of switchgear, it shall be stored in a dry and well ventilated place, and be covered well.

Maintenance

All components of switchgear are maintenance free in the statement life period of the product Gas tank is made of stainless steel. If the dashboard is scratched or damaged, oil paint must be used to repair in order to avoid corrosion.

The mechanical parts of the equipment are located in the outside of the gas tank and after the front panel. In this way, if necessary, it can be operated and replaced conveniently.

Surface anti-corrosion treatment is carried out for the mechanical parts. The moving parts are lubricated before leaving the factory, which could meet the using during life period. In the extreme conditions (dust, sand, and pollution), it must be inspected and maintained. In some certain cases, it may be replaced. Please check whether the lubrication oil is rinsed or wiped off in the moving mechanical parts.

Control and supervision of air

As a pressure sealing system, Switchgear does not need special inspection normally. But, gas pressure on pressure gage must be checked before operation, the pointer on pressure indicator shall be in the green area under normal condition.

Life period of the product

The development of the product follows IEC298 standard. Its designed life is more than 30 years under the normal condition. The switchgear is hermetic type, the expectation value of gas leakage is less than 0.1% every year. According to the reference pressure 1.4 bar, the switchgear will maintain the gas tightness during its life period, and the pressure is more than 1.2bar (when it is 20°C).



GENERAL

Switchgear RM6-40.5 includes a series of expandable SF6-insulated metal-clad switchgears at the voltage rating of 40.5kV. All live parts of primary high-voltage circuit are wholly enclosed in a welded cabinet of 3mm-thickness stainless steel sheets, which gives a small volume. The switchgear is not subject to the influence of surrounding conditions so that it guarantees the safe and reliable running and zero maintenance. It can be integrated as module by using plug-in expansion busbar. Meet requirements of end users or network nodes and satisfy demands of various substations and switching stations, box-type substations, cable branch boxes and wind turbine towers. It features the compact structure, safety, reliability, long life and zero maintenance.

RM6 series provides transformers with following protections:

- ◆ Load switch-fuse composite apparatus.
- ◆ Vacuum breaker with relay protection.

REFERENCE:

IEC62271-200	High-voltage switchgear and controlgear-Part 200: AC metal-enclosed Switchgear and controlgear for rated voltages above 1kV and up to and including 52kV
GB3906-2006	Alternating-current metal-enclosed switchgear and controlgear for rated voltages above 3.6 kV and up to and including 40.5 kV
GB1984-2003	High-voltage alternating-current circuit-breakers
JB/T3855-2008	High-voltage alternating-current vacuum circuit-breaker
GB16926-2009	High-voltage alternating current switch-fuse combinations
GB3804-2004	High-voltage alternating-current switches for rated voltage above 3.6 kV and less than 40.5 kV

TECHNICAL CHARACTERISTICS

- ◆ Complete functions provided by basic functional units such as load switch, load switch+ fuse composite apparatus and circuit breaker.
- ◆ Small volume, light weight, size down to 500*1010*1900(mm) and particularly suitable for wind turbine tower application.

- ◆ Simple operation, safe use, easy maintenance and zero maintenance for 30 years
- ◆ Enclosed design, zero exposed live component and long-term availability under severe conditions.
- ◆ Flexible modular integration with plug-in expansion busbar.



SERVICE CONDITIONS

- ◆ Elevation: Not more than 5000m above the sea level.
- ◆ Ambient temperature : Max: +50°C , Min:-40°C.
- ◆ Relative humidity : Daily average is not more than 95%, monthly average is not more than 90%.
- ◆ No apparent pollution of corrosive or combustible gas around.
- ◆ No regular violent vibration.
- ◆ Note: if deviation of normal service conditions occurs, the customer should inform the manufacturer before production.



TYPE AND DESIGNATION

RM6	---40.5	C F V	/630 /50	---20(25) ---31.5
Product of Naisen	Rated voltage kV	Panel Mark C: load switch F: load breaker + fuse combined Apparatus V: VCB	630: rated current A 50: rated current of fuse A	20(25): dynamic stable current of load switch, short circuit breaking current of circuit breaker kA 31.5: short circuit breaking current of fuse kA

TECHNICAL DATA

ELECTRICAL PARAMETERS OF LOAD SWITCH, LOAD SWITCH-FUSE COMPOSITE APPARATUS AND CIRCUIT BREAKER

S/N	name	unit	Parameter		
			C:Load switch	F:Composite apparatus	V:Circuit breaker
1	Rated voltage	kV	40.5		
2	Rated current	A	630	受限于高压熔丝	630
3	Rated frequency	Hz	50		
4	1min power frequency withstand voltage (RMS)(phase to phase , to earth/Disconnecter)	kV	95/118		
5	Lightning impulse withstand voltage (RMS)(phase to phase, to earth/Disconnecter)	kV	185/215		
6	Rated short time withstand current/time of duration	kA/s	20/4、25/4		20/4、25/4
7	Rated peak withstand current	kA	50、63		50、63
8	Rated short circuit making current (peak)	kA	50、63	80	50、63
9	Rated short circuit breaking current	kA		31.5	20、25
10	Rated operation sequence				O-0.3s-CO-180s-CO
11	Rated transfer current	A	1000		
12	Rated single capacitor bank/ back to back capacitor bank breaking current	A	630/400		
13	Mechanical life	time	5000		10000
14	Protection degree of gas-filled tank	IP	67		
15	Protection degree of mechanism compartment, instrument compartment and compartment	IP	4X		
16	SF6 gas rated pressure	MPa	0.04		
17	SF6 gas minimum pressure (gauge pressure at 20°C)	MPa	0.02		
18	SF6 gas annual leakage rate		≤0.1%		

MECHANICAL CHARACTERISTIC PARAMETERS OF LOAD SWITCH AND CIRCUIT BREAKER

S/N	name	unit	Parameter		
			Load switch	Circuit breaker	Three-position disconnecter
1	Rated short time breaking current	kA		20 25	
2	Contact pressure	N		2500±300 3100±300	
3	Clearance between opening contacts	mm	87±3	17±1	Lsolated moving ang fixed contact≥90 Grounding moving and fixed contact≥88
4	Over travel	mm	33±3	4±1	
5	Speed instant of touching	m/s	2.7±0.3	0.8±0.2	
6	Speed at instant of opening	m/s	2.5±0.3	1.7±0.25	
7	Contact closing bounce time	ms		≤3	
8	Asynchronous opening and closing of three pole contact	ms	≤3	≤3	≤5

ELECTRICAL PARAMETERS OF HV FUSE

Type	Rate voltage kV	Fuse current A	Rated current of fusant A	Rated breaking current kA
XRNT□-40.5	40.5	50	31.5\6.3\10\16\20\25\31.5\40\50	31.5

ELECTRICAL PARAMETERS OF OVERVOLTAGE PROTECTION DEVICE (SURGE ARRESTER)

System nominal voltage	Continuous running voltage	DC 1Ma reference voltage	2ms Rectangular current discharge capacity	Residual voltage of steep impulse current	Residual voltage of lightning impulse current	Residual voltage of operation impulse current	Power frequency reference voltage
(kV RMS)			(Peak value kV $\sqrt{2}$)				
35	40.8	73	400	154	134	114	51

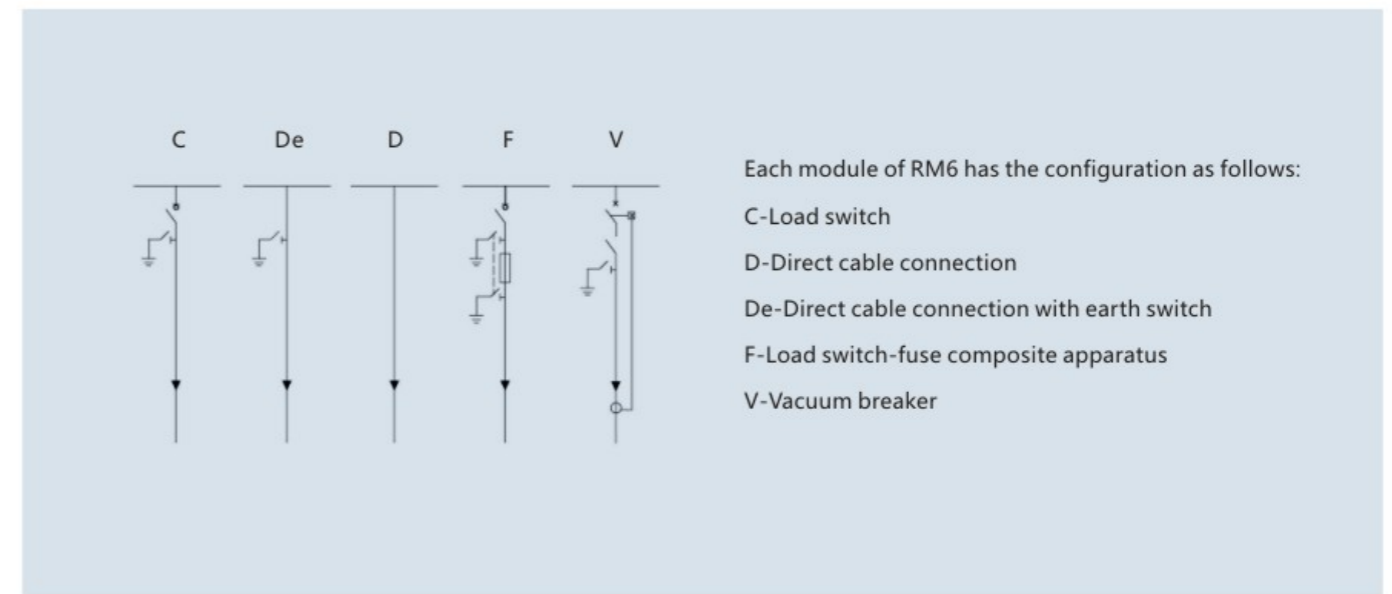
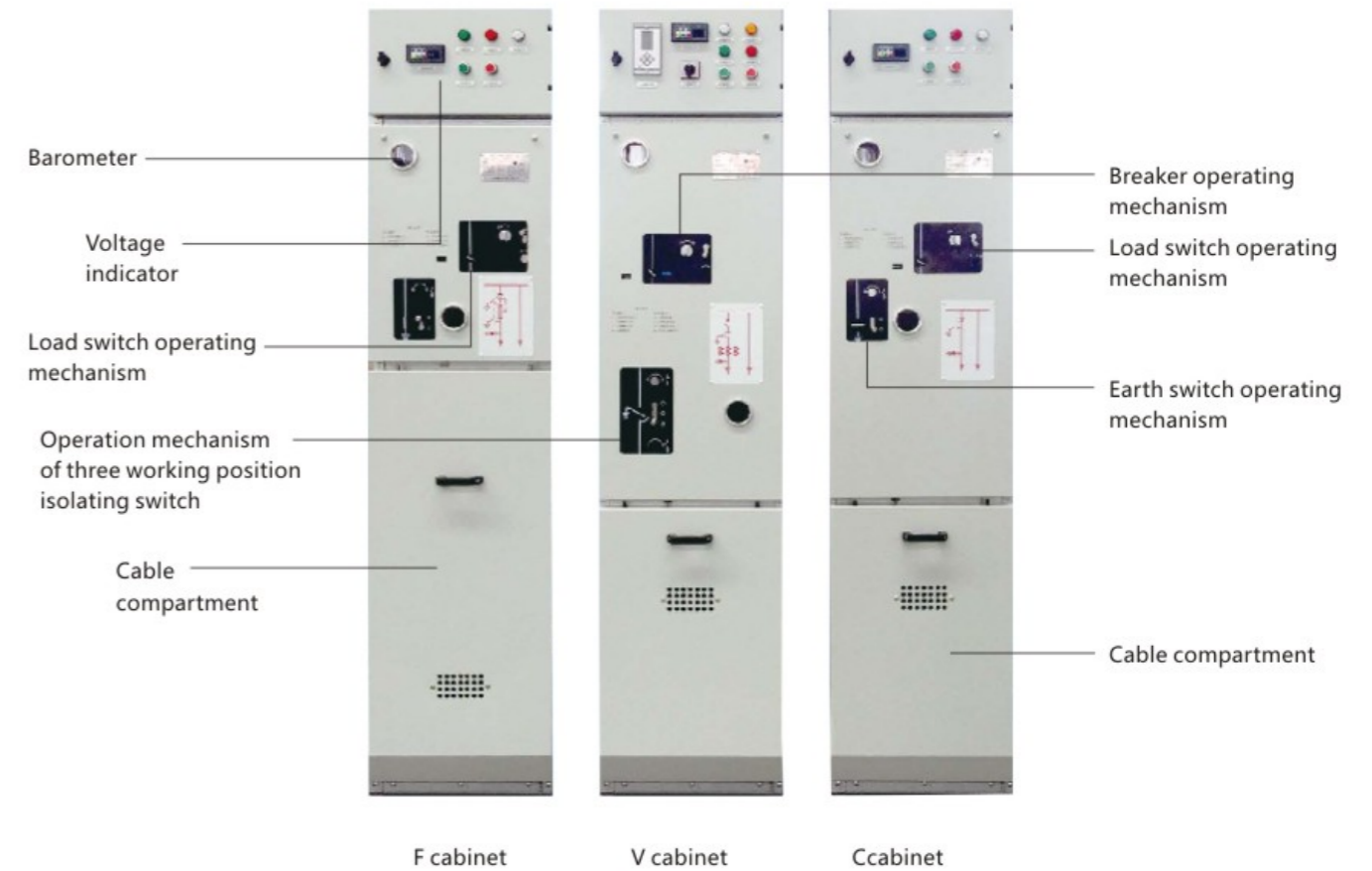
ELECTRICAL PARAMETERS OF CURRENT TRANSFORMER

Rated primary current	Rated secondary current	Accuracy class and rated secondary output (VA)				Inner hole (Cable hole) Diameter
		0.2	10P10	10P15	10P20	
300	5	10	15	10	10	80
400			20	10		80
300			15			100
400			10			100
500		15	25		10	120
600			30			120

ELECTRICAL PARAMETER OF POTENTIAL TRANSFORMER

Rated voltage ratio	Accuracy class combination	Rated secondary output (VA)	Limit
35/ $\sqrt{3}$ /0.1/ $\sqrt{3}$ /0.1/3	0.2/3P	30/100	600
	0.5/3P	100/100	
	1/3P	150/100	
	3/3P	300/100	

BASIC STRUCTURE



All parts of primary high-voltage circuit are wholly enclosed in a welded cabinet of 3mm-thickness stainless steel sheets. The SF6 gas at 0.04MPa is filled as arc-extinguishing and insulating medium. Monitor the pressure of gas with air gauge. The back of gas chamber is equipped with explosion-proof device. When the arc pressure is too high, the high-pressure gas in the cabinet triggers the explosion-proof device and is released behind the cabinet to protect the safety of operators.

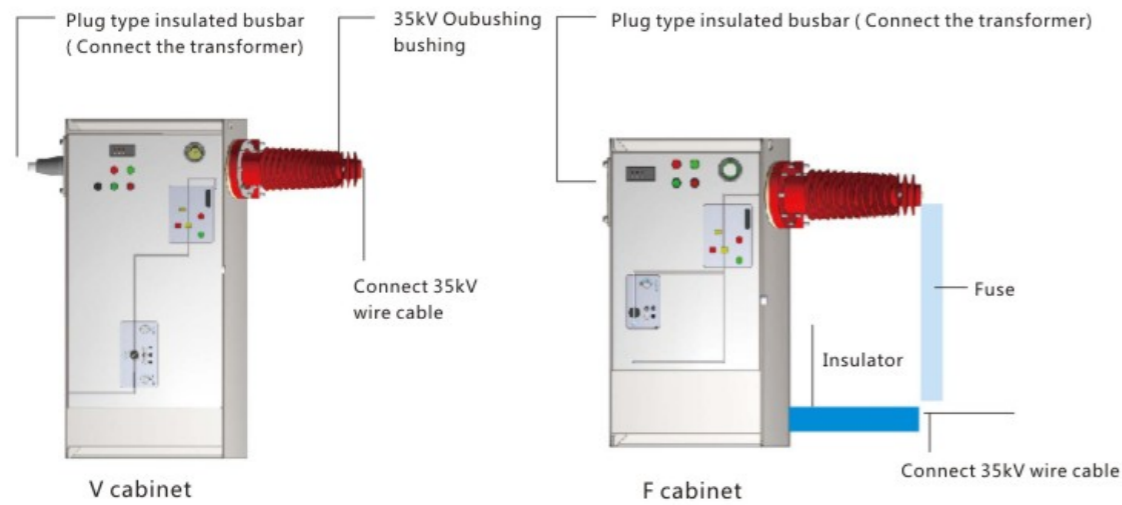
Our load switch adopts the structure of gas compression and inwards arc blowing. It has the strong arc quenching force and has no influence on the insulation between phase and to the ground. The dynamic and static contacts are arcing contacts to increase breaking times greatly.

A fuse and a load switch chamber comprise a transformer protection circuit. A high-voltage current-limiting fuse is mounted in the epoxy-cast insulated housing. After the fuse burns, it triggers the pin and causes the load switch to open.

An actuation chamber is in the front of ring main unit. In each functional circuit, load switch and breaker are equipped with manually/electrically - operated energy storage spring actuator while 3-position isolating switch and earth switch is equipped with manually - operated energy storage spring actuator. On the panel is a display of switch status. A padlock is provided for 3-position isolating switch and earth switch in order to avoid any unauthorized operation. A interlocking mechanism connects load switch, earth switch and door of cable chamber, and breaker, 3-position isolating switch and door of cable chamber respectively.

RM6 is a series of small metal-clad switchgears. In a SF6 insulation chamber, it can integrate at most four modules. Provide 10 configurations for distribution network and adapt to most ring network applications. Its typical configurations include DeF, CCF, CCCF, CCFF, CCC, CCCC, Dev, CCV, CCCV and CCVV. If more than 4 modules are required in a switchgear, connect switchgears with expansion busbar to shape a semi-module structure or connect all modules with expansion busbar for modular configuration.

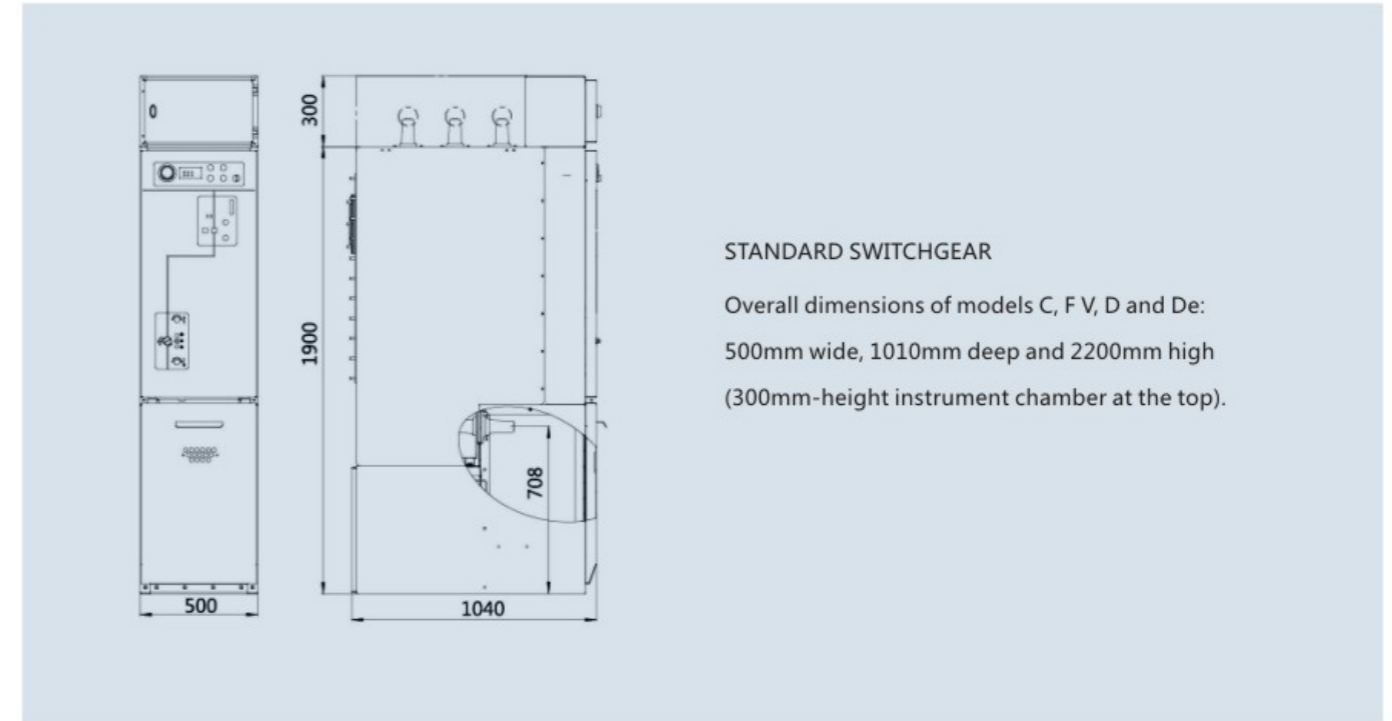
WALL-MOUNTED CABINET TYPE (BOX-TYPE SUBSTATION SPECIAL)



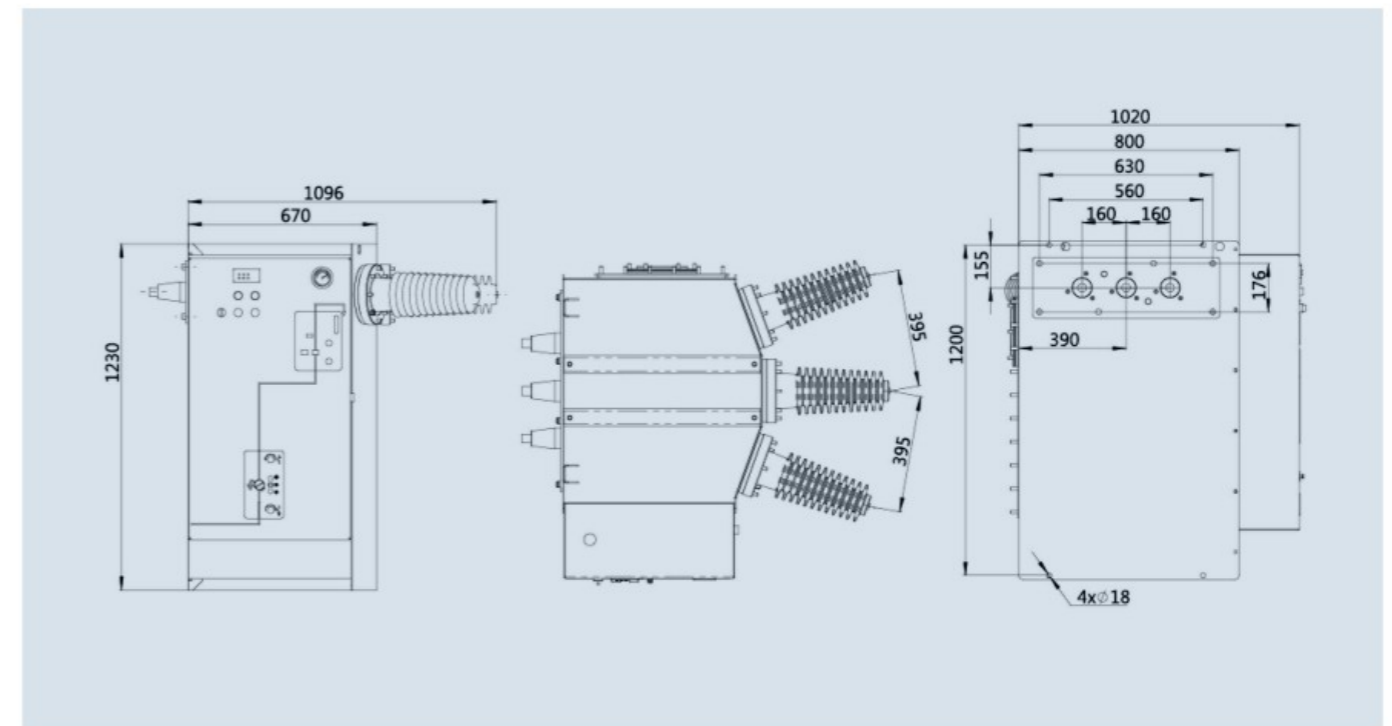
TRANSFORMER PROTECTION

- RM6 protects transformers with load switch-fuse composite apparatus or vacuum breaker + relay.
- Recommend the protection with breaker and relay for transformers of higher rating (above 1600kVA).
- The relay protection has two variants, i.e. self-powered digital relay and microprocessor protection monitor.

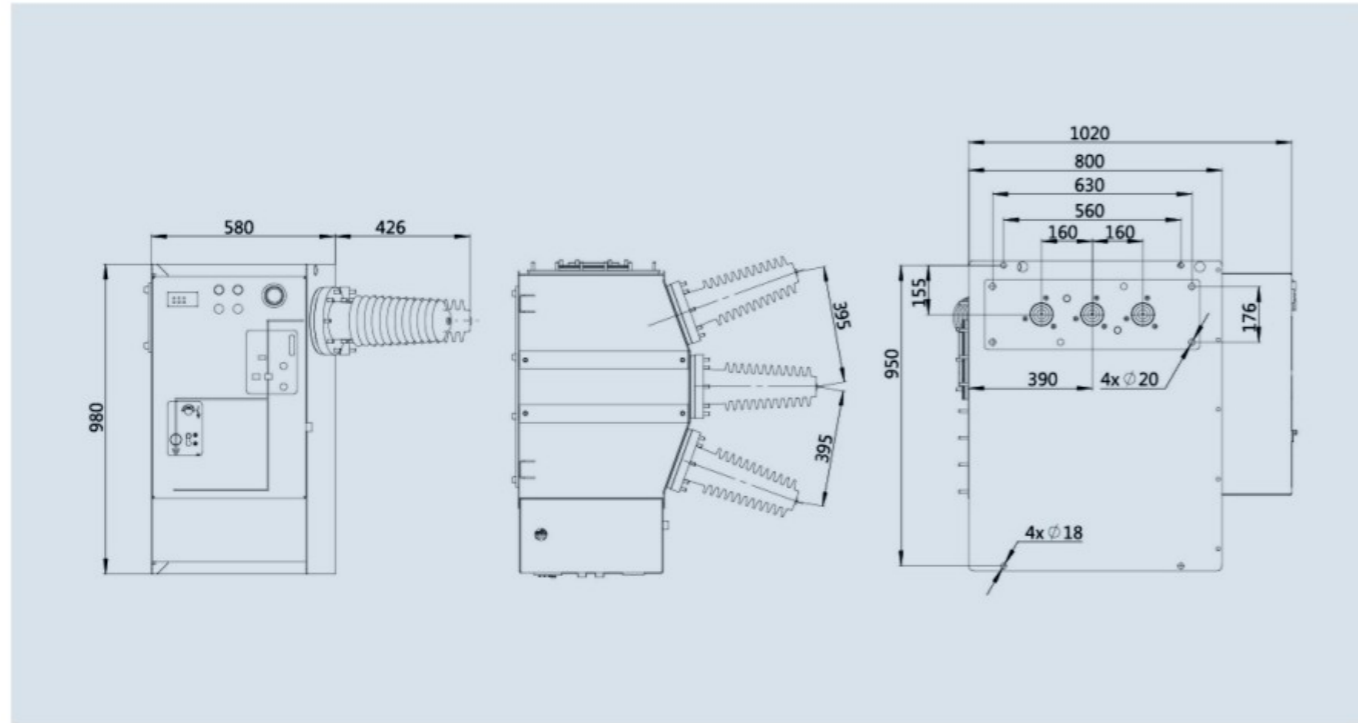
OUTLINE DIMENSIONS



WALL-MOUNTED V CABINET (BOX-TYPE SUBSTATION SPECIAL) DIMENSIONS



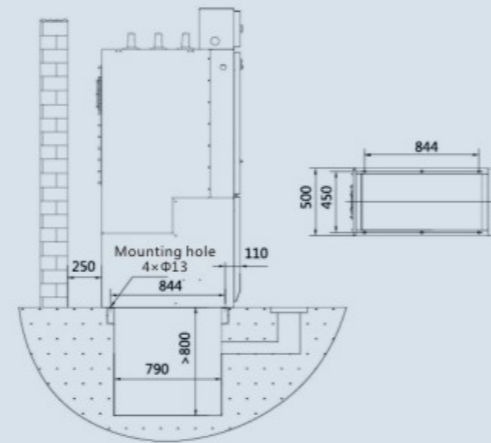
WALL-MOUNTED F CABINET (BOX-TYPE SUBSTATION SPECIAL) DIMENSIONS



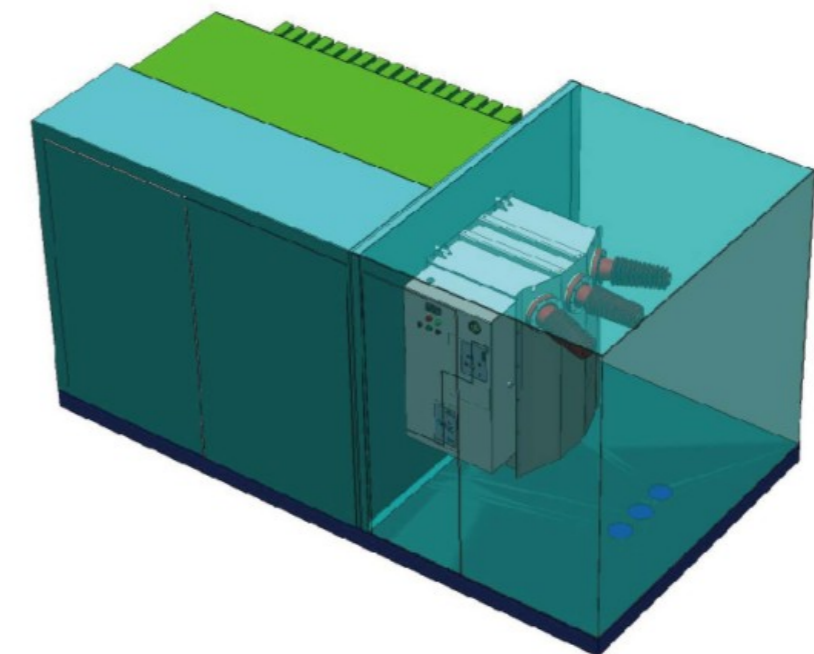
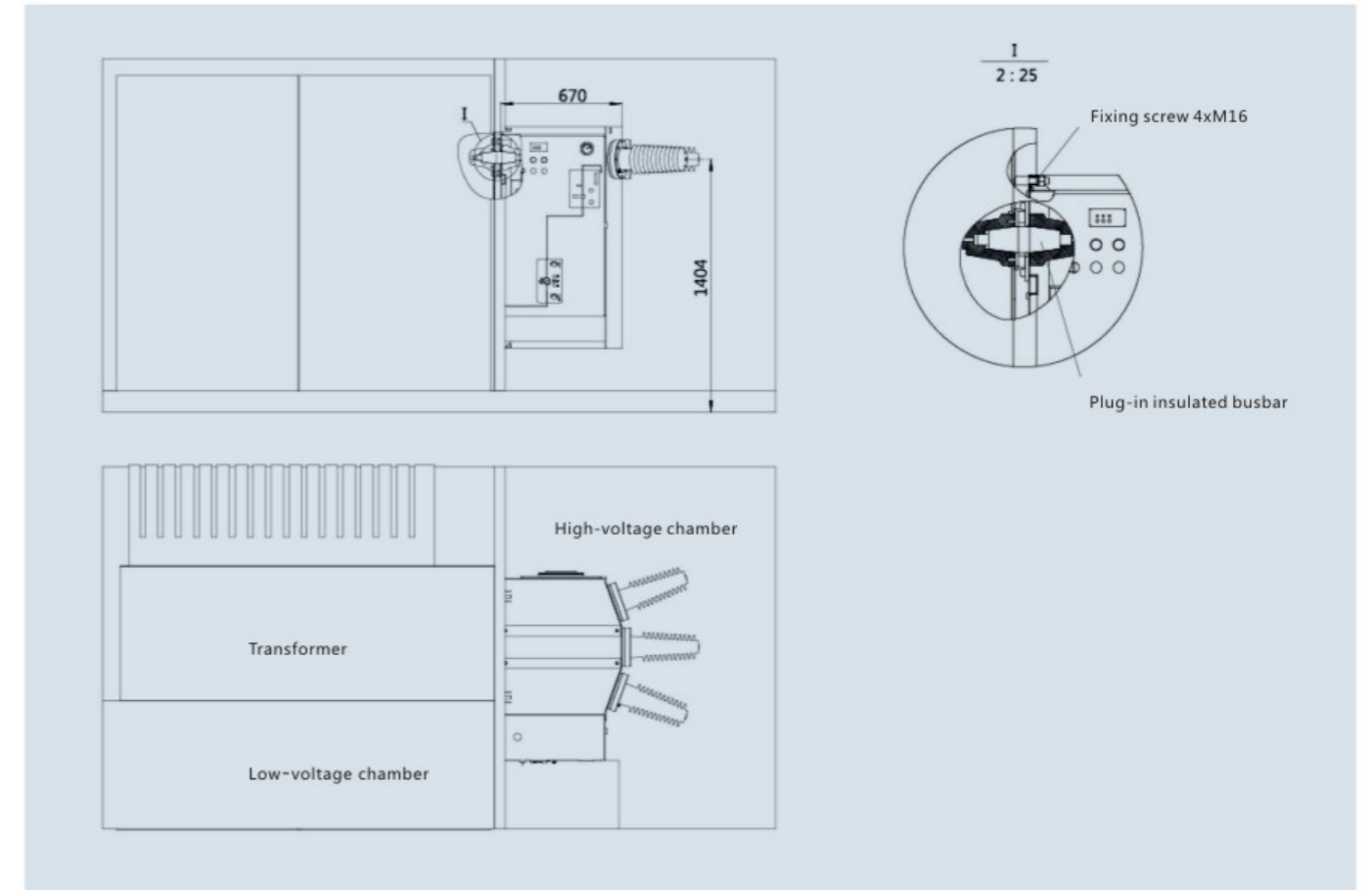
INSTALLATION, ADJUSTMENT AND MAINTENANCE

STANDAR CABINET INSTALLATION

- ◆ Load switch and vacuum switch produce a dynamic load of $8000N \pm 150N$ upwards and downwards upon opening and closing. It provides the basis for foundation stress estimation during the foundation design.
- ◆ Design and build the foundation with reference to the following diagram. Keep the foundation level.



WALL-MOUNTED CABINET INSTALLATION



INSTALLATION PROCEDURE AND NOTES

① Rank the switchgear on the basis according to a certain order, adjust the straightness, verticality and levelness of the assembly, then fix the switchgear on the basis U-steel by M10 bolt or using the method of spot welding.

② The fixed connection between the switchgears uses M8x30 bolt.

③ Installation of top solid insulating busbar (expansion cabinet).

④ Before installation, please clean all the components and accessories by cleaning paper.

⑤ Before the installation of cable terminals, the insulating bushing should be cleaned and coated with silicon grease (silicon grease is attached at the cable terminal box). During the whole installation process, please make sure that the silicone rubber products won't be lacerated by sharp-pointed items. After finishing the work of cable, the cable room and cable duct should be sealed by partitions.

⑥ The switchgears are integrated by the connection of earth busbars, check the omissions of working earth and protection earth. And check the connection circuit is breakovered or not.

⑦ Installation of secondary cable, the cable threads from the left bottom of the cabinet, enter the cable room along the side wall, and then connect to the relative terminal block. During construction, pay attention to the correctness of cable number and terminal number. After finishing the secondary cable construction, do not forget closing over the cable hole.

INSPECTION AND REPLACEMENT FOR FUSE

a. For the fuse with normal operation, its mechanical life can be more than 20 years. During the periodic inspection and maintenance of the equipment, the change of the fuse can be judged by the change of the fuse's internal resistance. The change range of internal resistance is within $\pm 10\%$.

b. Pay special attention to the replacement of fuse, for the reason that there is a safety range for the current limit fuse when in operation, it can not ensure that every fault condition is within the safety range. Such as release failure of the switchgear or the fuse is below its minimum breaking current action. For safety sake, after at least 10 minutes action of the fuse, isolate with the loaded switch of the circuit, and it should be replaced only when the earth switch is closed and both ends of the fuse are earthed. It should be ensured that the fuse is replaced with neutral condition.

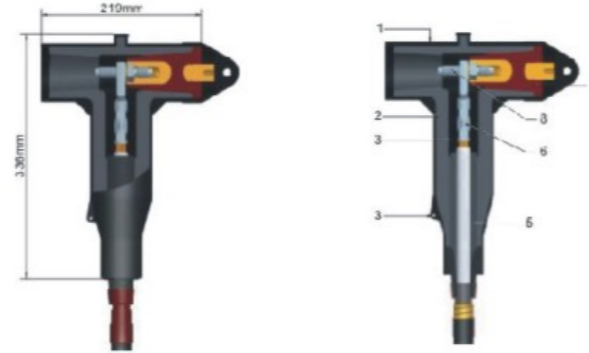
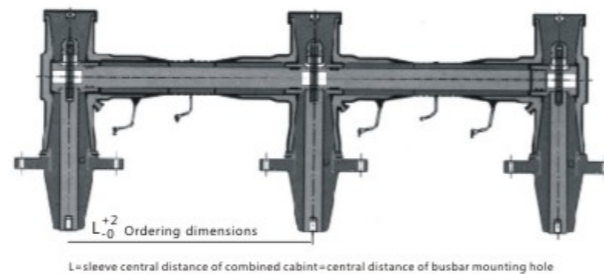


Figure 1: product structure drawing

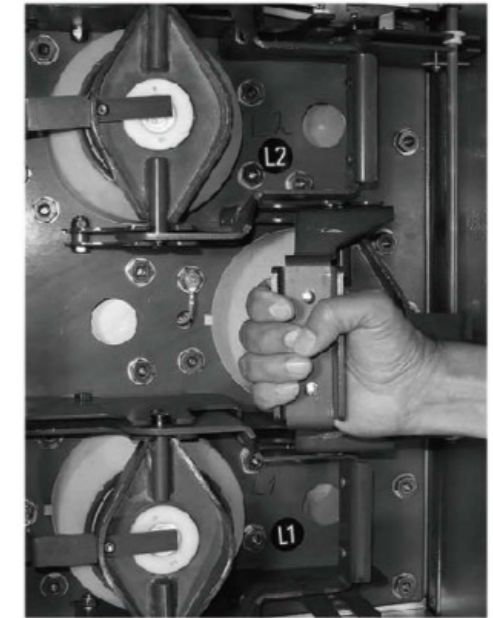
Figure 2: product structure drawing



L = sleeve central distance of combined cabinet = central distance of busbar mounting hole

c. For the replacement of the fuse, fuse room should be opened. Before that, the earth switch should be closed (earth) and the interlocking mechanism should be opened firstly, then the fuse room door can be opened to replace the fuse. In order to avoid electric shock and the damage of interlocking mechanism, the door should not be opened forcibly.

d. The fuse room door can be opened only when the load switch is opened and the upper and lower earth switch are closed (earth). When taking out the fuse, be gentle to avoid damaging the fuse enclosure. Meanwhile, check the silicon rubber head is intact or not.



ACCEPTANCE TEST AND PREPARATIONS BEFORE OPERATION

TEST ITEMS

The field acceptance test of the gas filled cabinet should comply with DL/T618 Gas insulation Metal-Clad Switchgear Field Acceptance Test Regulation. Its test items are as follows.

- ◆ Appearance check.
- ◆ Main circuit resistance measuring.
- ◆ Component test.
- ◆ Check and acceptance of SF6 gas.
- ◆ Gas leakage test.
- ◆ Moisture content test of SF6 gas.
- ◆ Main circuit insulation test.
- ◆ Auxiliary circuit insulation test.
- ◆ Interlock test.

PREPARATIONS BEFORE COMMISSIONING

- ◆ Turn on the power supply of control, signal, and lighting.
- ◆ When the load switch, disconnector and vacuum switch in other switchgears are in opening state, transmit power to the main busbar, and put the incoming cabinet into operation according to the specified operation procedure.
- ◆ Turn on the circuit breakers of the outgoing cubicle in turn, check the ammeter.

MAINTENANCE AND OVERHAUL

The operation and maintenance of the gas-filled cabinet should comply with DL/T603 Gas Insulation Metal-Clad Switchgear operation and maintenance Procedure.

- ◆ Patrol and inspection: at least once a day, if no one is on duty, other arrangement will be made. Inspect the appearance of the running gas-filled cabinet, notably inspect whether there is anything wrong with the equipment and make parameter record.
- ◆ Periodic inspection: once a year, or decided according to the actual situation. The inspection is arranged when the gas-filled cabinet is total or partial power cut. It is unnecessary to check the internal part of the gas-filled enclosure.
- ◆ Interim inspection: when a load switch or a breaker reaches the specified breaking times or the accumulative breaking current; when any abnormality is found or there is any failure in an inflatable switchgear. Dismantle and inspect a load switch, a breaker or other equipment in an inflatable switchgear after turning it off completely or partially. Determine the content and scope of inspection according to troubles. Such dismantling and inspection must be conducted or instructed by manufacturer.

SF₆ GAS QUALITY SUPERVISION

- ◆ SF₆ leakage detection: monitor the change of gas pressure according to the SF₆ pressure temperature curve, However, when the pressure inside the gas tank achieves to the lowest operational pressure, the system will sound the alarm, then gas should be supplemented in time.

TRANSPORTATION AND STORAGE

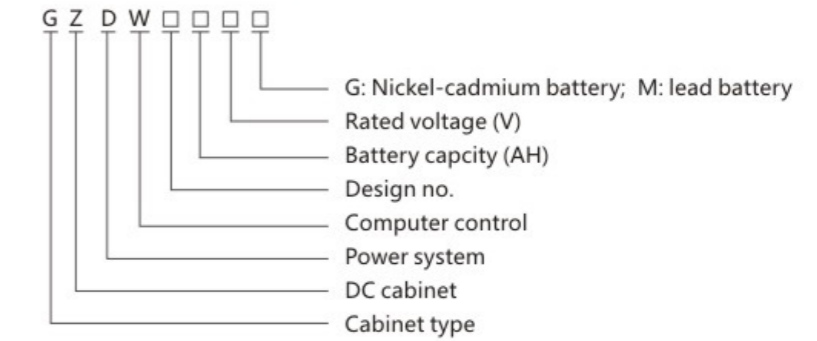
- ◆ After passing the factory test, the products can be packed and shipped, When packing, the products should be fixed on the chassis by bolt. During the transportation, the products can only stand on end and should not roll over or drop down.
- ◆ Before installation, the original packedes of the products should be kept in the storage, If they can not be put in the storage, they should protect against rain and moisture. The electrical components and spare parts should not be dismantled at discretion.



Overview

GZD(W) series (computer) DC. power cabinet is a new generation of replacement product developed for DC power cabinet of unmanned substation. It is suitable for the large, medium and small power plant and substation for DC power for the opening and closing of HV switchgear, relay protection, auto control and accident lighting at normal and fault conditions.

Model and meaning



Main technical data

- ◆ Input voltage : AC380V ± 10% ;
- ◆ Output voltage: DC220V、DC110V、DC48V;
- ◆ Output current : 10、20、30、40、50、60、100、200A;
- ◆ Stabilizing voltage accuracy : ≤ 1%;
- ◆ Stabilizing current accuracy : ≤ 1%;
- ◆ Ripple factor : ≤ 1%;
- ◆ Noise of equipment: ≤ 55db;
- ◆ Temperature of main transformer: ≤ 60°C;
- ◆ Operating mode : Continuous

Function features

- ◆ It has main, average and floating charge selection and the voltage can be regulated and has the function of stabilizing voltage and limiting current selection
- ◆ Computer monitoring unit adopts large screen LED display with such series data as cell voltage charging voltage, bus voltage, output voltage and current of battery charger, voltage and current of single piece of battery etc.
- ◆ Reoperation after loss of AC and the system can charge the battery in the best way as per battery's capacity. After removal operation of the computer normal operation of DC system is not affected.