

POWER TRANSMISSION AND
DISTRIBUTION PRODUCT SELECTION



Medium Voltage Switchgear YRM6-12/24 Gas-insulated Metal-enclosed Switchgear

• YRM6 fully insulated fully enclosed compact switchgear, which can realize functions of control, protection, measurement, monitoring, communication, etc. is especially suitable for places with small distribution facility site and high reliability requirements, and places with a relatively harsh natural environment and conditions. such as underground, highland and coastal areas.

PROFESSIONAL MANUFACTURER OF HIGH AND LOW VOLTAGE PRODUCTS

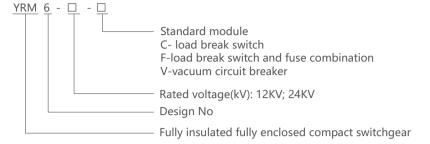
• It is mainly used in areas where land is tight and space is limited, high reliability is required, like industrial and mining enterprises and substations, subways, light rail railways, etc

General



YRM6-12~24 Gas-insulated Metal-enclosed Switchgear

Selection



Operating conditions

- 1. Ambient air temperature: -40°C~+40°C;
- 2. Relative air humidity: daily average <95%, monthly average <90%;
- 3. Altitude ≤1500m (under standard inflation pressure);
- 4. Seismic intensity <9 class;
- 5. Places free from fire, explosion, serious contamination, chemical corrosion and severe vibration.

Special conditions

Manufacturers and end users must agree on special Operating conditions that are different from normal operating conditions; If a particularly harsh operating environment is involved, the manufacturer and supplier must be consulted;

When electrical equipment is installed at an altitude of 1500 meters or more, special instructions are required to adjust the pressure during manufacturing. When the pressure is adjusted, the life of the switchgear itself has no significant effect.

Features

• Modular design

The switch is divided into fixed module and expandable module group. In the same SF6 insulated air chamber, up to6 modules can be configured. Switching cabinets with more than 6 modules must be connected with the expansion busbar to realize the semi-module. Structure, full module configuration can also be achieved by using an extended bus between all modules. Through the combination of different functional modules, a simple to complex power distribution scheme can be formed to meet various configuration requirements in the secondary substation and the opening and closing.

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• Compact structure

Except for the air-insulated metering cabinet, all modules are only 325mm wide and the metering cabinet width is 695mm; the cable joints of all units are the same height to the ground, which is convenient for on-site Features.

• Unaffected by the environment

All high-voltage live parts are installed in a sealed stainless steel case. The case is welded with a stainless steel plate and filled with SF6 gas at a working pressure of 1.4 bar. The degree of protection is IP67. It can be used in places where it is installed in damp, dusty, salt spray, mine, box-type substation and air pollution. Even the fuse compartment has an IP67 rating. The extension busbars are completely insulated and shielded to ensure that they are not affected by changes in the external environment.

• Highly reliable personal safety

All live parts are enclosed in the SF6 air chamber, the switch has a reliable pressure relief channel, the load and grounding switches are three-position switches, simplifying the interlocking between each other, reliable mechanical interlock between the cable compartment cover and the load switch.

Performance Index

- SF6 gas pressure: 1.4bar under 20°C (absolute pressure)
- Annual leakage rate: 0.25%/year
- Protection grade
- SF6 gas room: IP67
- Fuse tube: IP67
- Switchgear enclosure: IP3X
- Busbar
- Switchgear internal busbar: 400mm²Cu
- Switchgear earthing busbar: 150mm²Cu
- Thickness of gas room stainless steel enclosure: 3.0mm
- The front panel and the side panel of the switchgear, and the front cover of the cable room, the company's standard color is: jade color 7783; if users have special requirements, please put forward when ordering.

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Standard

- High-voltage alternating-current circuit-breakers (IEC 62271-100:2001, MOD)
- High-voltage alternating-current disconnectors and earthing switches (IEC 62271-102:2002,MOD)
- Common specifications for high-voltage switchgear and controlgear standards
- High-voltage alternating-current switches for rated voltage above 3.6kV and less than 40.5kV(IEC60265-1-1998,MOD)
- Alternating-current metal-enclosed switchgear and controlgear for rated voltages above 3.6kV and up to and including 40.5kV (IEC62271-200-2003, MOD)
- Degrees of protection provided by enclosure (IP code) (IEC 60529-2001,IDT)
- High-voltage alternating current switch-fuse combinations (IEC6227-105-2002,MOD)
- DL/T 402 Specification of high-voltage alternating-current circuit-breakers (IEC 62271-100-2001,MOD)
- DLT 403 HV vacuum circuit-breaker for rated voltage 12kv to 40.5kv
- DLT404 Alternating-current metal-enclosed switchgear and controlgear for rated voltages above 3.6kV and up to and including 40.5kV
- DL/T 486 HVAC disconnectors and earthing switches (IEC62271-102-2002,MOD)
- DLT593 Common specifications for high-voltage switchgear and controlgear standards IEC 60694-2002, MOD)
- DLT 728 Technical guide for the order of gas-insulated metal-enclosed switchgear (IEC815-1986, IEC 859-1986)
- DL/T 791 Specification of indoor AC HV gas-filled switchgear panel

Technical data

			Value						
NO.	ltems	Unit	Load break switch	Combination	Vacuum circuit breaker				
1	Rated coltage		kV	12/24					
2	Rated frequency		Hz	50/60					
2 R 3 Pc 4 Li 5 R 6 R 7 R 8 R 9 R	Power frequency withstand voltage	phase-to-phasel	А	60	≤125	630/1250			
	Fower frequency withstand voltage	across open contacts	kV	42/65					
3 P 4 L 5 R 6 R	Lightning impulse withstand voltage	phase-to-phasel	kV						
	Lightning impulse withstand voltage	kV	85/145						
5	Rated short time withstand current		KA/4s	20/20	/	20/25			
6	Rated peak withstand current		KA	50/50	/	50/63			
7	Rated short circuit making current (peak)		KA	50/50	80/80	50/63			
8	Rated short circuit current		KA	/	31.5/31.5	20/25			
9	Rated transfer current		А	/	1700/1400	/			
10	Rated closed-loop breaking current		А	630/630	/	/			
11	Rated cable charging breaking current		А	10/25	/	/			
12	Mechanical life		Times	5000	3000 5000				

Note 1: depends on the rated current of fuse.

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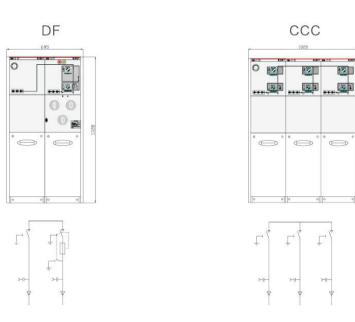
Standard modules

Each module of the YRM6 type switchgear has the following configurations:

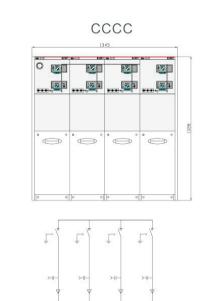
- D cabinet lifting module
- See standard configuration and features in "cable connection module without grounding knife"
- C cabinet load switch module
- See standard configuration and features in "load switch module"
- F cabinet-load switch and fuse combination module
 See standard configuration and characteristics in "load switch and fuse combination module"
- V cabinet vacuum switch module
- See standard configuration and features in "vacuum switch module"
- Capacitive voltage indicator for the incoming bushing
 Install a pressure gauge that monitors SF6 density in each chamber
- Lifting lug
- Operating handle

Optional configurations

Electric operating mechanism/cable short circuit and ground fault indicator/current transformer and meter

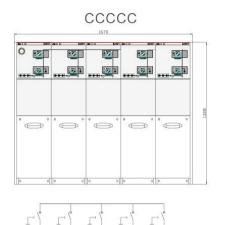




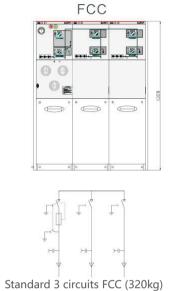


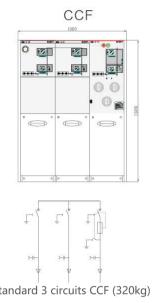
YRM6-12~24 Gas-insulated Metal-enclosed Switchgear

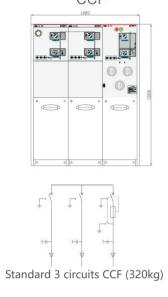
Optional configurations

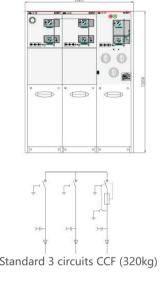


Standard 5 circuits CCCC (480kg)







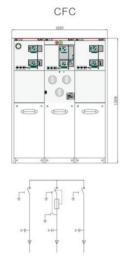


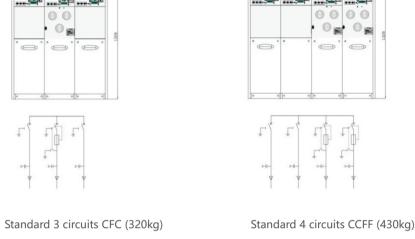
Medium Voltage Switchgear

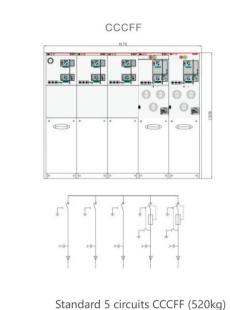
YRM6-12~24 Gas-insulated Metal-enclosed Switchgear

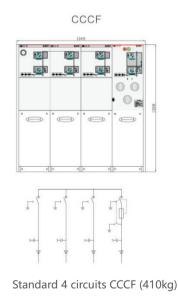
CCFF

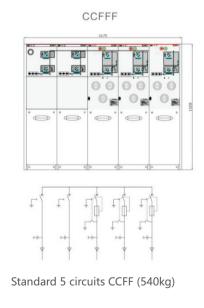
Optional configurations

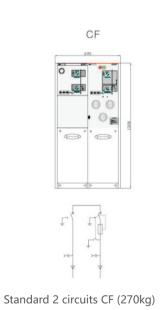


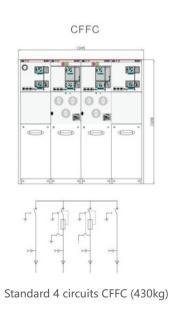


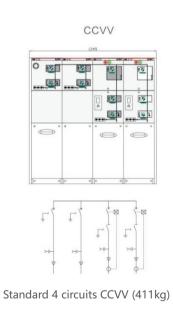


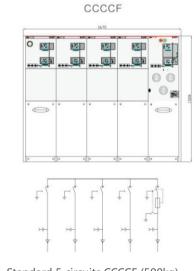












Standard 5 circuits CCCCF (500kg)

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YRM6-12~24 Gas-insulated Metal-enclosed Switchgear

Standard expansion modules

Available modules

Model	Name	12KV cabinet width	24KV cabinet width
С	Load switch module	Width=325mm	Width=375mm
D	Cable connection module without grounding knife	Width=325mm	Width=375mm
F	Load switch fuse combination electrical module	Width=325mm	Width=375mm
V	Vacuum circuit breaker module	Width=325mm	Width=375mm
SL	Busbar segmentation switch module (load switch)	Width=325mm	Width=375mm
SVBR	Busbar segmentation switch module (vacuum circuit breaker) Sv is always with the bus lifting module	Width=650mm	Width=650mm
М	Meter module 12kV	Width=695mm	Width=695mm
PT	Module	Width=370 or 695mm	Width=370 or 695mm

Note: A single module must add extension before it can be used.



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Expansion module-load switch module C

Standard configuration and characteristics

- 630A internal bus
- Three working-position load/earth switch
- Three working-position single-spring operating mechanism, with two independent load switch and earth switch operating shafts
- Load switch and earth switch position indication
- Outgoing bushing in front horizontal arrangement, 630A 400 series bolted bushing
- Capacitive voltage indicator indicating that the bushing is live
- For all switch functions, there is a convenient add-on padlock on the panel
- SF6 gas pressure gauge (only one in each SF6 gas box)
- Ground busbar
- Interlocking of the earth switch to the front panel of the cable compartment

Optional configuration and characteristics

- Reserved bus extension
- External bus
- Load switch operation motor 110V/220V DC/AC
- Short circuit and ground fault indicator
- Measure toroidal current transformer and ammeter
- Meter toroidal current transformer and watt-hour meter
- A lightning arrester or double cable head can be installed at the cable incoming bushing
- Incoming live grounding lock (lock the earth switch when the bushing is energized) 110V/220VAC
- Auxiliary contacts

Load switch position 2NO+2NC

Earth switch position 2NO+2NC

Pressure gauge with signal 1 NO

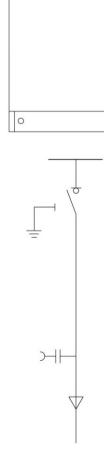
Arc extinguisher with signal contact 1 NO

• Secondary device can be installed in

Secondary line chamber at the top of the switchgear

Low voltage box at the top of the switchgear





YRM6-12~24 Gas-insulated Metal-enclosed Switchgear

VRM6-12 (C)

Expansion module-without grounding knife module D

Standard Configuration and Characteristics

- 630A internal bus
- Outgoing bushing in front horizontal arrangement, 630A 400 series bolted bushing
- Capacitive voltage indicator indicating that the bushing is live
- SF6 gas pressure gauge (only one in each SF6 gas box)
- Ground busbar

Optional configuration and characteristics

- Reserved bus extension
- External bus
- Short circuit and ground fault indicator
- Measure toroidal current transformer and ammeter
- Meter toroidal current transformer and watt-hour meter
- A lightning arrester or double cable head can be installed at the cable incoming bushing
- Secondary device can be installed in Secondary line chamber at the top of the switchgear Low voltage box at the top of the switchgear



Medium Voltage Switchgear

YRM6-12~24 Gas-insulated Metal-enclosed Switchgear



Expansion module-load switch and fuse combination module F

Standard Configuration and Characteristics

- 630A internal bus
- Three working-position load switch, the fuse head end is mechanically linked with the fuse tail end earth switch
- Three working-position double-spring operating mechanism, with two independent load switch and earth switch operating shafts
- Load switch and earth switch position indication
- Fuse tube
- Fuse placed horizontally
- Fuse tripping indication
- Outgoing bushing in front horizontal arrangement, 200A 200 series plug-in bushing
- Capacitive voltage indicator indicating that the bushing is live
- For all switch functions, there is a convenient add-on padlock on the panel
- SF6 gas pressure gauge (only one in each SF6 gas box)
- Ground busbar
- Fuses for transformer protection parameter 12kV max.125A fuse
- Interlocking of the earth switch to the front panel of the cable compartment

Optional configuration and characteristics

- Reserved bus extension
- External bus
- Load switch operation motor 110/220V DC/AC
- Paralleling tripping coil 110/220V DC/AC
- Paralleling closing coil 110/220V DC/AC
- Measure toroidal current transformer and ammeter
- Meter toroidal current transformer and watt-hour meter
- Incoming live grounding lock (lock the earth switch when the bushing is energized)
 110V/220V AC
- Auxiliary contacts

Load switch position 2NO+2NC

Earth switch position 2NO+2NC

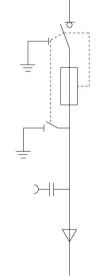
Pressure gauge with signal 1 NO

Fuse blown 1 NO

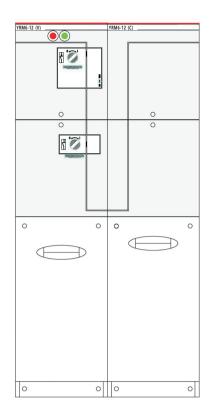
• Secondary device can be installed in

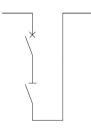
Secondary line chamber at the top of the switchgear

Low voltage box at the top of the switchgear



YRM6-12~24 Gas-insulated Metal-enclosed Switchgear





Expansion module-busbar sectional switch module (circuit breaker) SVBR

Standard configuration and characteristics

- 630A internal bus
- 630A vacuum circuit breaker
- Two working-position double-spring operating mechanism for vacuum circuit breaker
- Vacuum circuit breaker lower disconnect switch
- Disconnect switch single-spring operating mechanism
- Mechanical interlocking of vacuum circuit breaker and disconnect switch
- Vacuum circuit breaker and disconnect switch position indication
- For all switch functions, there is a convenient add-on padlock on the panel
- SF6 gas pressure gauge (only one in each SF6 gas box)
- SV is always connected to the busbar lifting switchgear, occupying two module widths together

Optional configuration and characteristics

- Reserved bus extension
- External bus
- Vacuum circuit breaker operation motor 110V/220V DC/AC
- Paralleling tripping coil 110/220V DC/AC
- Paralleling closing coil 110/220V DC/AC
- Key interlocking
- Auxiliary contacts

Circuit breaker position 2NO+2NC

Disconnect switch position 2NO+2NC

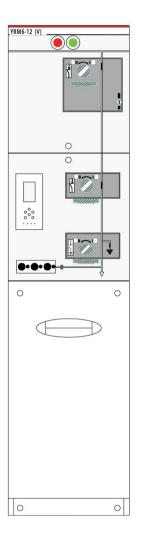
• Secondary device can be installed in

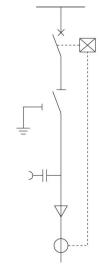
Secondary line chamber at the top of the switchgear

Low voltage box at the top of the switchgear

Medium Voltage Switchgear

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Expansion module - vacuum circuit breaker module V

Standard configuration and characteristics

- 630A internal bus
- 630A transformer/line protection vacuum circuit breaker
- Two working-position double-spring operating mechanism for vacuum circuit breaker
- Vacuum circuit breaker lower three working-position disconnect/earth switch
- Three working-position disconnectearth switch single-spring operating mechanism
- Mechanical interlocking of vacuum circuit breaker and three working-position switch
- Vacuum circuit breaker and three working-position switch position indication
- Electronic protection relay
- Trip coil (for relay action)
- Outgoing bushing in front horizontal arrangement, 630A 400 series bolted bushing
- Capacitive voltage indicator indicating that the bushing is live
- For all switch functions, there is a convenient add-on padlock on the panel
- SF6 gas pressure gauge (only one in each SF6 gas box)
- Ground busbar
- Interlocking of the earth switch to the front panel of the cable compartment

Optional configuration and characteristics

- Reserved bus extension
- External bus
- Vacuum circuit breaker operation motor 110V/220V DC/AC
- Paralleling tripping coil 110/220V DC/AC
- Paralleling closing col 110/220V DC/AC
- Measure toroidal current transformer and ammeter
- Meter toroidal current transformer and watt-hour meter
- Incoming live grounding lock (lock the earth switch when the bushing is energized) 110V/220V AC
- Key interlocking
- Auxiliary contacts

Vacuum switch position 2NO+2NC

Disconnect switch position 2NO+2NC

Earth switch position 2NO+2NC

Vacuum switch trip signal 1 NO

Pressure gauge with signal 1 NO

Secondary device can be installed in
 Secondary line chamber at the top of the switchgear

Low voltage box at the top of the switchgear

• Other relays such as SPAJ140C

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YRM6-12 (C)

Expansion module-busbar sectional switch module (load switch)SL

Standard configuration and characteristics

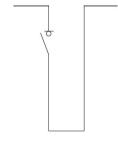
- 630A internal bus
- Disconnect switch
- Single-spring operating mechanism
- Switch position indication
- For all switch functions, there is a convenient add-on padlock on the panel
- SF6 gas pressure gauge (only one in each SF6 gas box)

Optional configuration and characteristics

- Reserved bus extension
- External bus
- Load switch operation motor 110V/220V DC/AC
- Key interlocking
- Auxiliary contacts

Load switch position 2NO+2NC

Secondary device can be installed in
 Secondary line chamber at the top of the switchgear
 Low voltage box at the top of the switchgear



Medium Voltage Switchgear

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Expansion module-12kV metering cabinet

Standard configuration and characteristics

- 2pcs current transformers
- 2pcs voltage transformers
- Fuse for PT protection
- Low voltage components

Voltmeter

Ammeter

W×H×D=695×1334×820mm

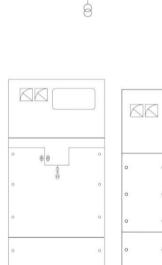
 $W \times H \times D = 695 \times 1680 \times 820$ mm(with instrument box)

Optional configuration and characteristics

- Zinc oxide arrester
- Capacitive voltage indicator indicating the switchgear is electrified
- Low voltage components

1pc active watt-hour meter

1pc reactive watt-hour meter



Expansion module-12kv voltage transformer cabinet

Standard configuration and characteristics

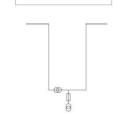
- 1pc or 2pcs voltage transformer
- Fuse for PT protection
- Voltmeter

W×H×D=695×1334×820mm

 $W \times H \times D = 695 \times 1680 \times 820$ mm (with instrument box)

Optional configuration and characteristics

- Zinc oxide arrester (695 width)
- Capacitive voltage indicator indicating the switchgear is electrified



YRM6-12~24 Gas-insulated Metal-enclosed Switchgear

Incoming / outgoing line protection

- Use vacuum switch / vacuum circuit breaker module
- The transformer or line protection is a vacuum switch/vacuum circuit breaker, with protective relays and current transformers. When the fauilt curent reaches the setting current set by the protection relay, the protection relay issues acommand to trip the switch through the trip unit.)

Transformer / line protection

The YRM6 provides two types of transformer protection: load switch fuse combination and circuit breaker with relay protection.

Use load switch fuse combination module

Transformer protection is a combination of current limiting high voltage fuse and load switch. The fuse compartment will be mounted behind a separate, latched enclosure at the front of the unit. The load switch uses a spring charging mechanism that can be triggered by a fuse striker. To facilitate the replacement of the fuse, an operating handle can be used to remove the end cap of the fuse compartment. The trip mechanism of the fuse is placed in front to ensure the water proof performance of the entire system. The load switch fuse combination uses a spring-loaded type of backup-protection type current limiting fuse, and the striker side faces the front of the switchgear during installation.

Fuse-transformer comparison table

100%	Rated capacity of power transfoormer (KVA)															
Un(kV)	25	50	75	100	125	160	200	250	315	400	500	630	800	1000	1250	1600
3	16	25	25	40	40	50	50	80	100	125	160	160				
3.3	16	25	25	40	40	50	50	63	80	100	125	160				
4.15	10	16	25	25	40	40	40	50	63	80	100	125	160			
5	10	16	25	25	25	40	40	50	50	63	80	100	160	160		
5.5	6	16	16	25	25	25	25	50	50	63	80	100	125	160		
6	6	16	16	25	25	25	25	40	50	50	80	100	125	160	160	
6.6	6	16	16	25	25	25	25	40	50	50	63	80	100	125	160	
10	6	10	10	16	16	25	25	25	40	40	50	50	80	80	125	125
11	6	6	10	16	16	25	25	25	25	40	50	50	63	80	100	125
12	6	6	10	16	16	16	16	25	25	40	40	50	63	80	100	125
13.8	6	6	10	10	16	16	16	25	25	25	40	50	50	63	80	100
15	6	6	10	10	16	16	16	25	25	25	40	40	50	63	80	100
17.5	6	6	6	10	10	16	16	16	25	25	25	40	50	50	63	80
20	6	6	6	10	10	16	16	16	25	25	25	40	40	50	63	63
22	6	6	6	6	10	10	10	16	16	25	25	25	40	50	50	63
24	6	6	6	6	10	10	10	16	16	25	25	25	40	40	50	63

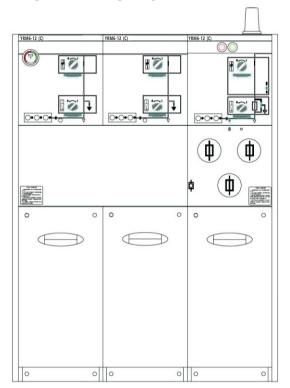
Medium Voltage Switchgear

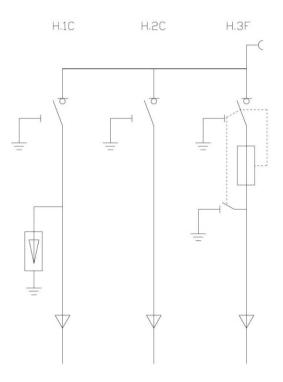
YRM6-12~24 Gas-insulated Metal-enclosed Switchgear

Plan Instructions

Plan 1 CCF+

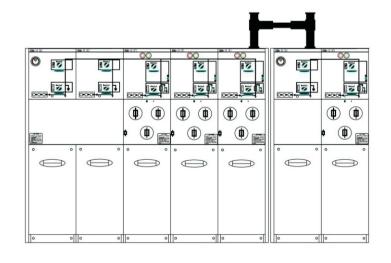
Incoming line installed lightning arrester and with reserved extension

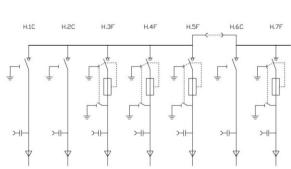




Plan 2 CCFFF=CF

1 set at most 5 units, more than 5 units need to expand the bus connection

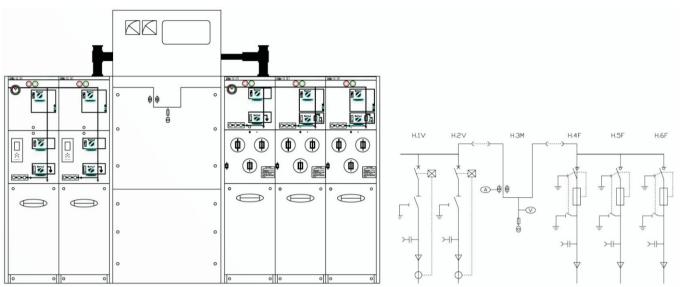




YRM6-12~24 Gas-insulated Metal-enclosed Switchgear

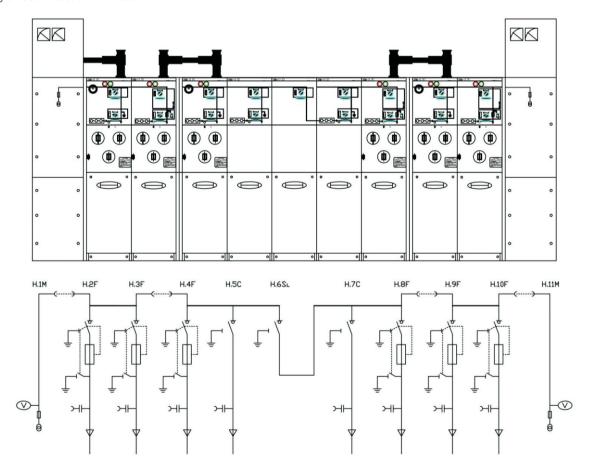
Plan 3 VV=M=FFF

High voltage side measurement



Plan 4 PT=FF=FCSLCF=FF=PT

PT Single busbar section with busbar PT



Medium Voltage Switchgear

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Annex

1. Auxiliary contacts

2NO+2 NC indicator switch positions are available on all load switches and circuit breakers. A parallel trip coil(AC or DC) can be mounted to the transformer/switch breaker. The LV control unit is located behind the front panel.

2. Voltage indication

A capacitive voltage indicator indicates whether the bushing is energized and the socket on it can be used for the nuclear phase.

3. Short circuit / ground fault indicator

To facilitate fault location, the cable switch module can be equipped with a short circuit/ground fault indicator for simple fault detection.

4. Electric operation

The manual operation of the cable switch unit and the transformer unit is a standard solution. It is also possible to install an electric operating mechanism. Cable switch, vacuum circuit breaker, and earth switch are operated by mechanism located behind the front panel. All switches and circuit breakers can be operated by operating the handle (standard configuration) or can be equipped with a motor operating mechanism (accessory). However, the earth switch can only be operated manually and is equipped with a mechanism that has the ability to close the fault current. Electric operating mechanisms are easy to implement in stages.

5. Cable connection

The YRM6 switchgear is fitted with standard bushings. All bushings are the same height from the ground and are protected by a cable compartment cover. This cover can be interlocked with the earth switch. For dual cab incoming, a dedicated dual cable compartment cover can also be used.

6. Pressure indicator

Usually equipped with a pressure indicator, this indicator is in the form of a pressure gauge. Electrical contacts can also be provided to indicate a pressure drop.

7. External busbar

The YRM6 switchgear can be equipped with an external busbar with rated current 1250A.

8. Secondary line chamber / low voltage box

The YRM6 switchgear can be equipped with a secondary line compartment or a low voltage box at the top of the switchgear.

The secondary line compartment is used to install an ammeter (with or without a changeover switch) and a live blocking control unit.

The low voltage box is used to install relays such as SPAJ140C,REF, and can also be equipped with an ammeter (with or without changeover switch) and a live blocking control unit.

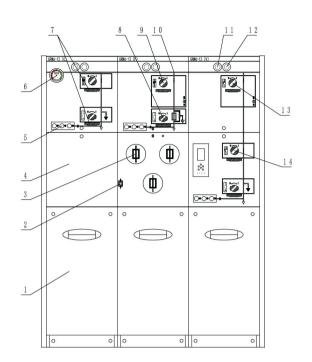
9.Lightning arrester

The cable incoming/outgoing module of the YRM6 type switchgear can be equipped with a zinc oxide lightning arrester at the cable; a zinc oxide lightning arrester can also be installed on the busbar or in the M cabinet.

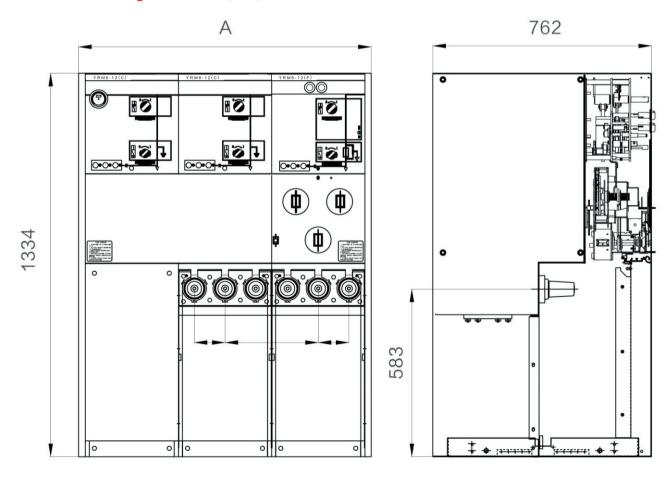
YRM6-12~24 Gas-insulated Metal-enclosed Switchgear

Switchgear structure diagram

- 1. Cable room
- 2. Fuse blow indicator
- 3. Fuse room
- 4. Installation room
- 5. charged display
- 6. Pressure indicator
- 7. Padlock device on the panel
- 8. Earth switch operating hole
- 9. Load switch operation hole
- 10. Analog circuit diagram
- 11. Opening button
- 12. Closing button
- 13. Circuit breaker operation hole
- 14. Disconnect switch operating hole foundation diagram



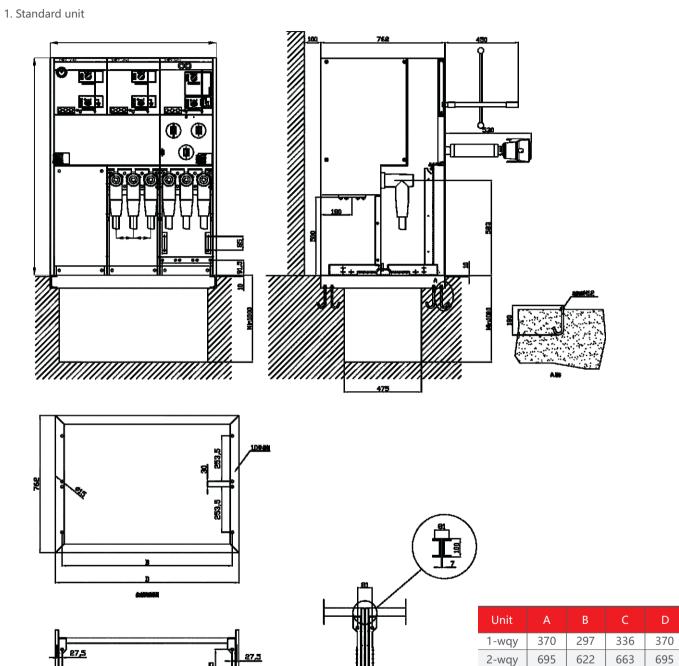
Overall and mounting dimensions(mm)



Medium Voltage Switchgear

YRM6-12~24 Gas-insulated Metal-enclosed Switchgear

Foundation diagram



Expansion module connection diagram Note: When using a three-core cable with a section larger than 240mm², if the CT cable is installed, it should be forked in the cable trench and considered for fixing.

1020

947

1345 | 1272

1670 | 1597

988

1313

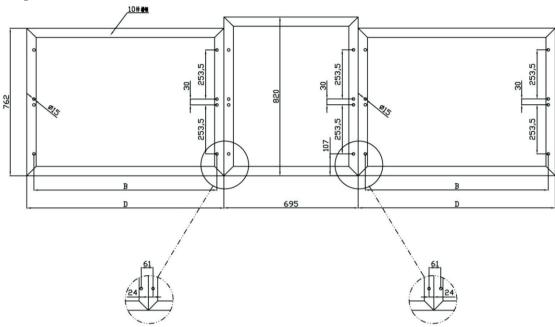
1636

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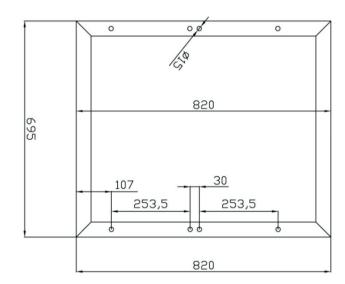
YRM6-12~24 Gas-insulated Metal-enclosed Switchgear

Foundation diagram

2. 10kV metering cabinet



Top view of the base channel steel when the YRM6cabinet is connected to the 10kV M cabinet or PT cabinet



Foundation diagram of YRM6cabinet connected to 10kV M cabinet or PT cabinet

Ordering Instructions

When ordering, the following technical information must be provided:

- Main circuit diagram, arrangement diagram, and layout diagram
- Switchgear secondary circuit schematic diagram;

If the switchgear is used under special environmental conditions, it should be proposed.

Medium Voltage Switchgear

YRM6-12~24 Gas-insulated Metal-enclosed Switchgear

Accessories and auxiliary components

Cable accessories: used for connecting switchgear and external circuits, while ensuring the safety and reliability of electrical insulation. It mainly includes two types of front and rear cable joints, as shown in the following figure:



Cable connector installation mode:

