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MXGN Series
Air-insulated Ring Switchgear
3.6kV-36kV



PRODUCT CATALOGUE

Murge Electric Co.,Ltd.

COMPANY PROFILE

Since its foundation, Murge Electric Co., Ltd. has been engaged in R&D, manufacturing and sales of MV electrical switchgears, MV vacuum circuit breakers and other MV&LV components and accessories. It has a registered equivalent capital of 28 million US dollars, covering an area of 84000m² and having staff over 600 people, located in Wenzhou Economic and Technological Development Zone.

Murge has established a sound management system in accordance with the ISO9001 Quality Management System, ISO14001 Environmental Management System, OHSAS18001 Occupational Health and Safety Management System and other standards. With strong technical R&D capacity, we created an advanced intelligent manufacturing system based on lean production and integration of information technology and industrialization. We have imported advanced production and testing equipment such as Japanese-made CNC punching machine, laser cutting machine, automatic welding robot, helium leak detection equipment, and APG injection machine. Our products have obtained relevant certificates at home and abroad, and are well-received by customers because of good quality and service.

Focus on user, just do better. Adhering to the philosophy of customer orientation, we strive to continuously advance our technology innovation, product improvement and customer satisfaction.



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泛有限公司
Co.,Ltd.



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» MXGN Air-insulated Ring Switchgear

3.6kV~36kV

Product Overview

MXGN series cubicle-type fixed metal-enclosed switchgear is applicable for 3.6~36kV ring main unit power supply and radial power supply system. It also can be applied to the terminal power supply or fitted into a cubicle-type substation for the control and protection of electric power. It can be used to protect and control the electrical equipment in power stations, transformer substations and distribution substations in settings such as industrial, manufacturing, residential and mining application.

Applied Standards

IEC 62271-200 High-voltage Switchgear and Controlgear-Part 200: AC Metal-enclosed Switchgear and Controlgear for Rated Voltages Above 1kV and Up to and Including 52kV;

IEC 62271-105 High-voltage Switchgear and Controlgear-Part 105: High-voltage Alternating Current Switch-Fuse Combinations;

IEC 62271-102 High-voltage Switchgear and Controlgear-Part 102: Alternating Current Disconnectors and Earthing Switches;

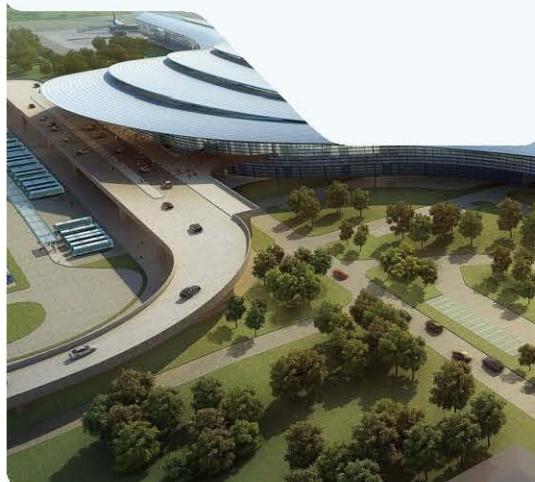
IEC 62271-103 High-voltage Switchgear and Controlgear-Part 103: High-voltage Alternating Current Load Break Switch;

Normal service condition

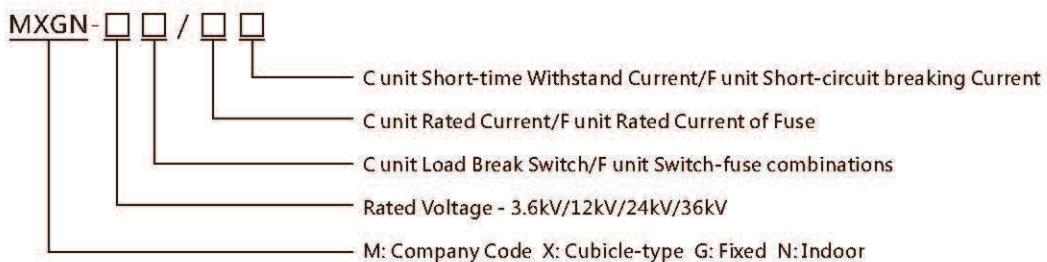
- Ambient air temperature: -25°C~+40°C;
- Altitude ≤1,000m;
- Daily average relative humidity ≤95%, and monthly average relative humidity ≤90%;
- No frequent strenuous vibrations;
- Ambient environment shall not be exposed to dust, corrosive gas, steam or salt mist, etc.; Once exceeding the above normal operating conditions, the user shall consult with the manufacturer.

Structural Features

- Switchgear body is made of high-quality aluminum-zinc coated steel plate, processed by CNC processing equipment, characterized in high precision, high strength, anti-corrosion, lightweight and functional versatility.
- It has characteristics of high reliability, long service life and low maintenance requirement.
- The interlock is safe and easy to operate.
- A reliable earthing protection system and pressure releasing channel (optional) at the back of switchgear is designed to ensure personal safety.



Product Model



Technical parameter

1	Rated Voltage	kV	12	24	36
2	Rated Current	A	630	630	630
3	Rated Frequency	Hz	50	50	50
4	Rated short-time power-frequency withstand voltage /1min (phase-to-phase & to-earth/across the isolating distance)	kV	28/32	50/60	70/80
4	Rated lightning impulse withstand voltage (phase-to-phase & to-earth/across the isolating distance)	kV	75/85	125/145	175/195
5	Rated short-time withstand current	kA /s	25/3	20/3	16/1
6	Rated peak withstand current	kA	62.5	50	40
7	Rated short-circuit making current	kA	62.5	50	40
8	Rated transfer breaking current	A	1700	1400	630
9	Rated closed-loop breaking current	A	630	630	630
10	Maximum rated current of the fuse	A	200	200	63
11	Mechanical Endurance	Main Switch	ops	M2(5000)	M2(5000)
		Earthing Switch	ops	M1(2000)	M1(2000)
12	Electrical Endurance			Class E3	Class E3
13	IAC class			A-FLR 20kA/1s 25kA/1s	A-FLR 16kA/1s 20kA/1s
14	Degree of protection	Enclosure		IP 4X	IP 4X
					IP 4X

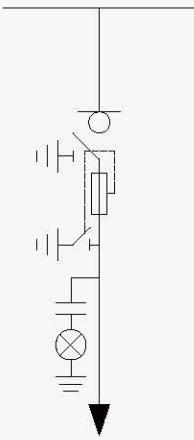
Basic Configuration

Diagram	Model	Function	Standard Configuration	Optional Configuration
	C	Three-position load break switch unit - load break switch has three work positions - close-open-earthing, mainly applied to the connection, control and branch of the cable incoming and outgoing of the ring network.	<ul style="list-style-type: none"> ■ Busbar ■ Three-position load break switch ■ Manual operating mechanism ■ Capacitive voltage indicator ■ Interlocking device ■ Manometer ■ Earthing bar ■ Enclosure ■ Metal plinth ■ Operating handle 	<ul style="list-style-type: none"> ■ Motorized operating mechanism ■ Short-circuit and earthing fault indicator ■ Earthing interlock device ■ Current transformer ■ Voltage transformer (replacing cable connection) ■ Pressure - relief duct ■ Surge arrester ■ Terminal side panel

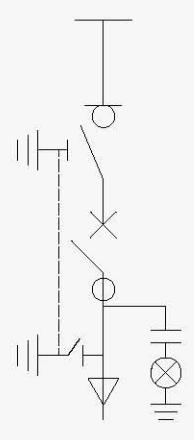
Note: Switch module + mechanism can be provided separately

Diagram	Model	Function	Standard Configuration	Optional Configuration
	CJ	Two-position load break switch unit - load break switch has two work positions of open-close, mainly applied to the connection, control and branch of the cable incoming and outgoing of the ring network.	<ul style="list-style-type: none"> ■ Busbar ■ Two-position load break switch ■ Manual operating mechanism ■ Capacitive voltage indicator ■ Interlocking device ■ Manometer ■ Earthing bar ■ Enclosure ■ Metal plinth ■ Operating handle 	<ul style="list-style-type: none"> ■ Motorized operating mechanism ■ Short-circuit and earthing fault indicator ■ Earthing interlock device ■ Current transformer ■ Voltage transformer (replacing cable connection) ■ Pressure - relief duct ■ Surge arrester ■ Terminal side panel

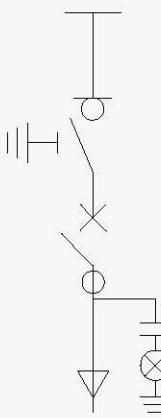
Note: Switch module + mechanism can be provided separately

Diagram	Model	Function	Standard Configuration	Optional Configuration
	F	Switch-fuse combination unit - load break switch and fuse, mainly applied to the control and protection of distribution transformers.	<ul style="list-style-type: none"> ■ Busbar ■ Three-position load break switch ■ Manual operating mechanism ■ Earthing Switch ■ Capacitive voltage indicator ■ Fuse trip device with indicator ■ Fuse base ■ Interlocking device ■ Manometer ■ Earthing busbar ■ Enclosure ■ Metal plinth ■ Operating handle 	<ul style="list-style-type: none"> ■ Short-circuit and earthing fault indicator ■ Voltage transformer (replacing cable connection) ■ Pressure - relief duct ■ Surge arrester ■ Trip coil ■ Terminal side panel

Note: Switch module + mechanism can be provided separately

Diagram	Model	Function	Standard Configuration	Optional Configuration
	V	Circuit breaker unit - the combination of three-position load break switch, vacuum circuit breaker and earthing switch; reliable interlocking devices are fitted between vacuum circuit breaker and three-position load break switch, between three-position load break switch and auxiliary earthing switch; circuit breaker unit has a current transformer and protective relay.	<ul style="list-style-type: none"> ■ Busbar ■ Three-position load break switch ■ Manual operating mechanism ■ Earthing Switch ■ Circuit breaker ■ Capacitive voltage indicator ■ Current transformer ■ Relay protection device ■ Interlocking device ■ Manometer ■ Earthing busbar ■ Enclosure ■ Metal plinth ■ Operating handle 	<ul style="list-style-type: none"> ■ Motorized operating mechanism ■ Short-circuit and earthing fault indicator ■ Pressure releasing channel ■ Surge arrester ■ Current transformer meter ■ Terminal side panel

Note: Switch module + mechanism + circuit breaker can be provided separately

Diagram	Model	Function	Standard Configuration	Optional Configuration
	VJ	Circuit breaker unit without the auxiliary earthing switch, applying a combination of three-position load break switch and vacuum circuit breaker.	<ul style="list-style-type: none"> ■ Busbar ■ Three-position load break switch ■ Manual operating mechanism ■ Capacitive voltage indicator ■ Circuit breaker ■ Current transformer ■ Protection Relay ■ Interlocking device ■ Manometer ■ Earthing busbar ■ Enclosure ■ Metal plinth ■ Operating handle 	<ul style="list-style-type: none"> ■ Motorized operating mechanism ■ Short-circuit and earthing fault indicator ■ Pressure - relief duct ■ Surge arrester ■ Current transformer meter ■ Terminal side panel

Note: Switch module + mechanism + circuit breaker can be provided separately

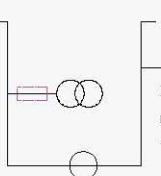
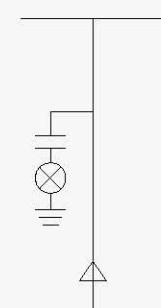
Diagram	Model	Function	Standard Configuration	Optional Configuration
	M	The metering unit, current transformer of different ratios can be provided as required.	<ul style="list-style-type: none"> ■ Busbar ■ Capacitive voltage indicator ■ Current transformer ■ Voltage transformer ■ VT protecting fuse ■ Earthing busbar ■ Metal plinth ■ Operating handle 	<ul style="list-style-type: none"> ■ Meter

Diagram	Model	Function	Standard Configuration	Optional Configuration
	D	Cable feed unit, without load break switch, convenient to realize incoming/outgoing extension or arrester connection. Mainly applied for cable and busbar connection, or for busbar rising purposes.	<ul style="list-style-type: none"> ■ Busbar ■ Bushing ■ Capacitive voltage indicator ■ Earthing busbar ■ Enclosure ■ Metal plinth 	<ul style="list-style-type: none"> ■ Short-circuit and earthing fault indicator ■ Current transformer ■ Voltage transformer ■ Pressure - relief duct ■ Surge arrester ■ Meter ■ Terminal side panel

Function Descriptions

Appearance



Structure Descriptions

Three Parts of Switchgear

- ① LV compartment
- ② Load break switch
- ③ Enclosure

Structure Descriptions



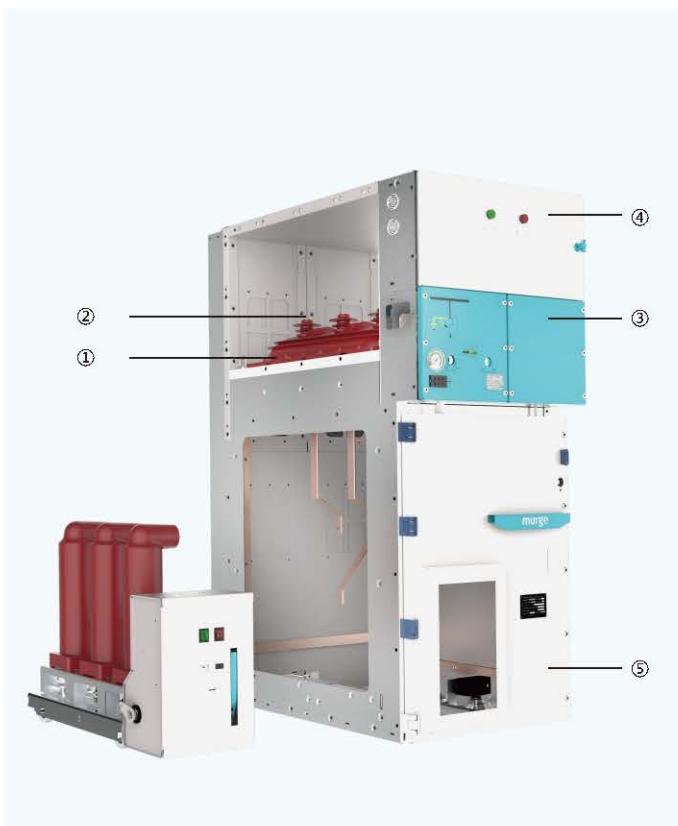
① **Switch compartment** : The load break switch or disconnector is sealed in the compartment filled with SF₆ gas, and “sealing pressure” meets IEC standard.

② **Main basbur compartment** : all main busbars are installed on the same level, so that panels are extensible to both sides.

③ **LV compartment** : this compartment has low-voltage fuse, protection relay, terminal strip, etc; if more space shall be required, a low-voltage extension space can be attached at the top of switchgear.

④ **Operating mechanism compartment** : this compartment houses manual or motorized mechanism to switch to close, open or earthing position.

⑤ **Cable compartment** : front accessible cable compartment allows easy connection of cables. This compartment will include a second earthing switch shall transformer protection configuration be adopted.



① **Switch compartment** : The load break switch or disconnector is sealed in the compartment filled with SF₆ gas, and “sealing pressure” meets IEC standard.

② **Main basbur compartment** : all main busbars are installed on the same level, so that panels are extensible to both sides.

③ **Operating mechanism compartment** : this compartment houses manual or motorized mechanism to switch to close, open or earthing position.

④ **LV compartment** : this compartment has low-voltage fuse, protection relay, terminal strip, etc; if a low-voltage extension space can be attached at the top of switchgear.

⑤ **Cable compartment** : front accessible cable compartment allows easy connection of cables. Current transformer, voltage transformer, circuit breaker can be included shall relevant application design be adopted.

Operating Principle SF₆ Switchgear

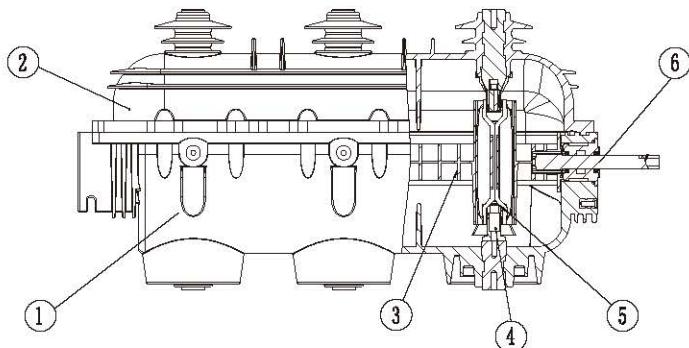
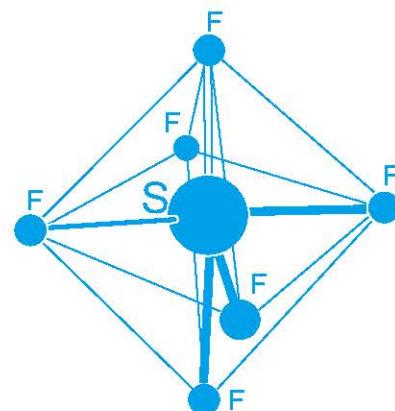
SF₆ Gas

As SF₆ gas tends to absorb free electrons and has strong electronegativity, it provides secure dielectric and arc-extinguishing performance.

FMG-□ switch

It uses SF₆ gas as an insulating and arc-extinguishing medium, therefore resulting in a good breaking capacity:

- Maintenance-free, long service life;
- Reliable against switching overvoltage;
- Safe to operate.



- ① Lower casing
- ② Upper casing
- ③ Rotary shaft
- ④ Fixed contact
- ⑤ Moving contact
- ⑥ Rotary seal device

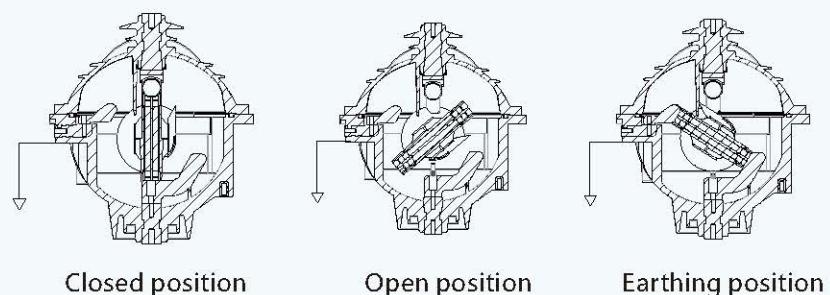
Sealing Performance

Three-position rotary LBS is filled with SF₆ gas with a relative pressure of 0.4bars which is in accordance with IEC requirements of "Enclosed Pressure System", with an annual leak rate less than 0.05%. Sealing performance has been strictly inspected before leaving the factory.



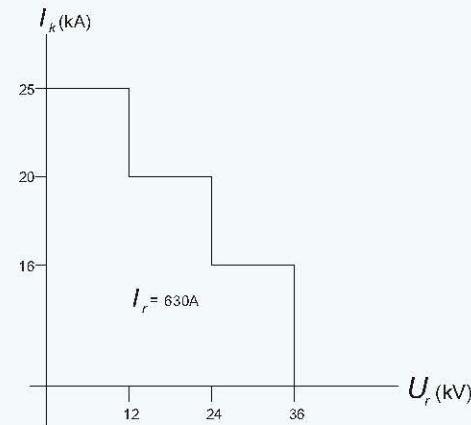
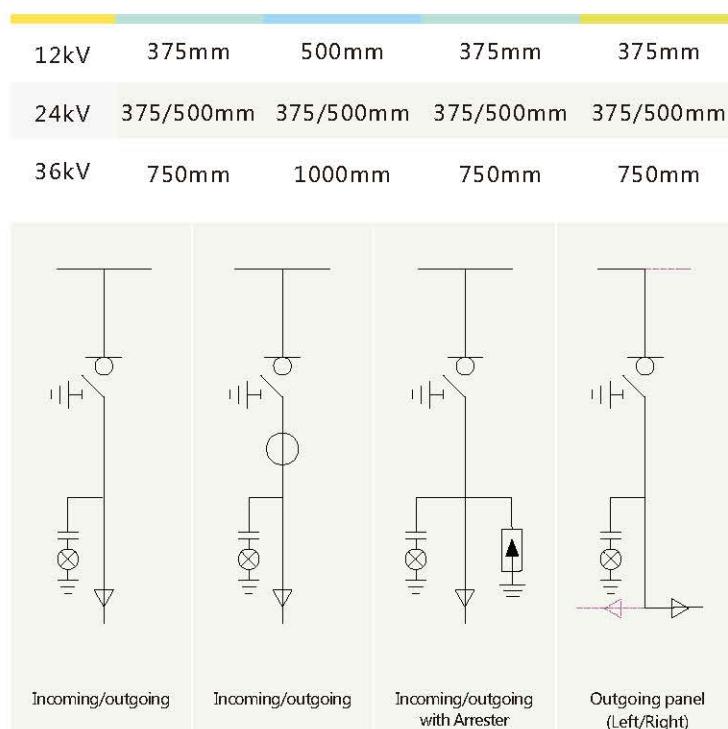
Use Safety

- Three-position LBS with secure interlock to prevent mis-operation;
- It has both functions of breaking and disconnecting at the same time;
- In the case of short-circuit malfunction, overpressured SF₆ gas will break through safety diaphragm to the back of the switchgear to ensure operating safety.



MXGN-□C

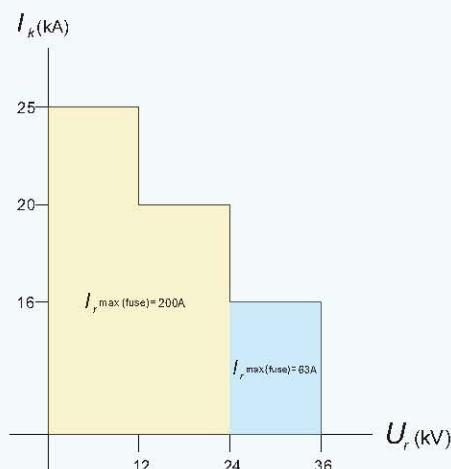
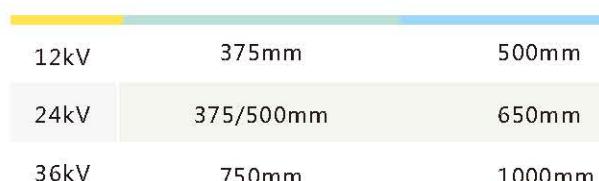
Load break switch unit width



Electrical Characteristics

MXGN-□F

Switch-fuse combination unit width



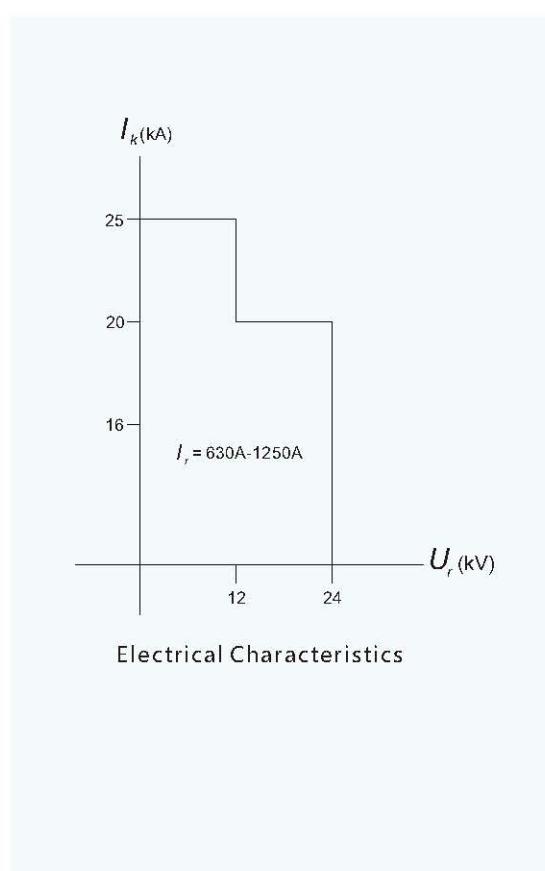
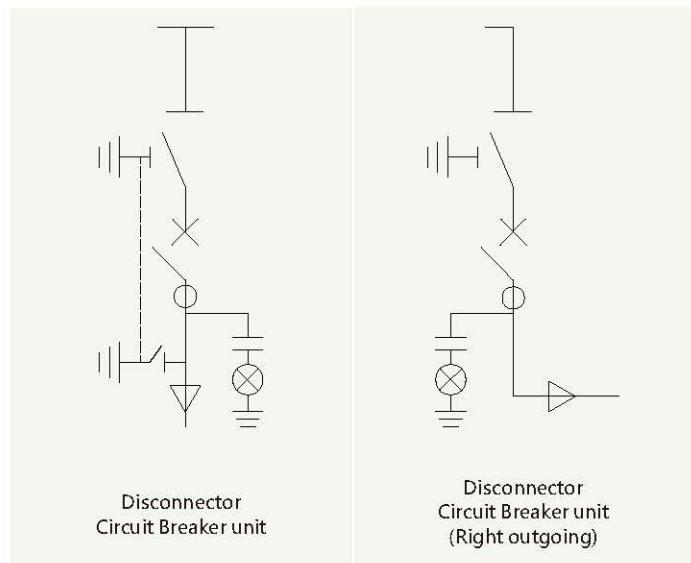
Electrical Characteristics

- ※ $I_r(\text{LBS Switch}) = 630\text{A}$
- ※ $I_r(\text{fuse})$ depends on the characteristics of the fuse.
- ※ For selection of fuse, please refer to the fuse selection table.

Switch-fuse combination unit

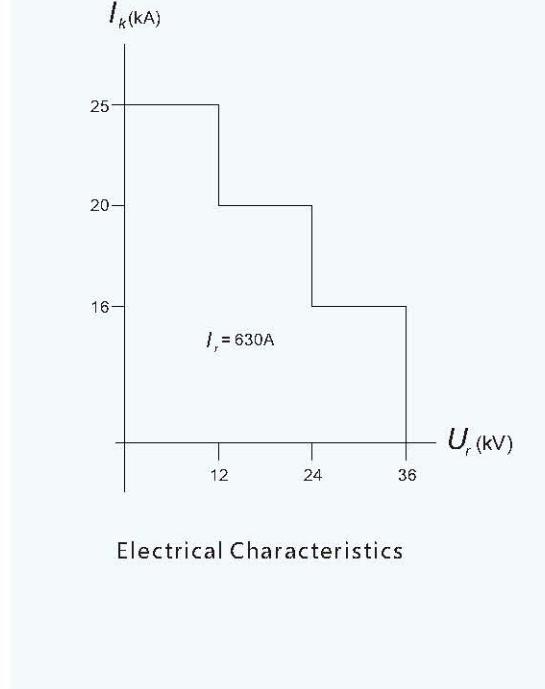
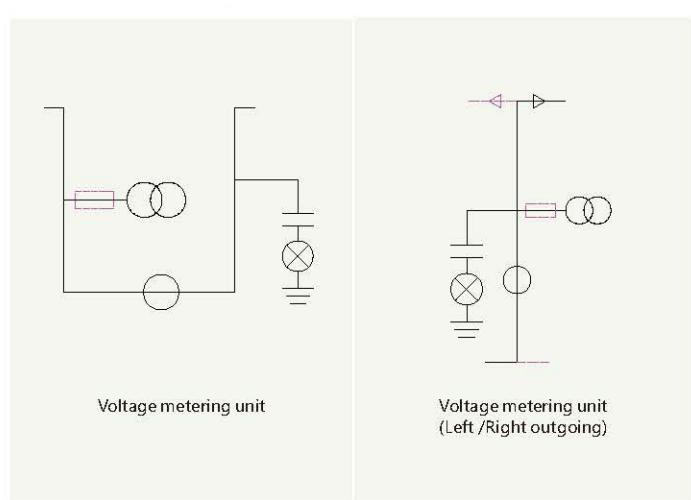
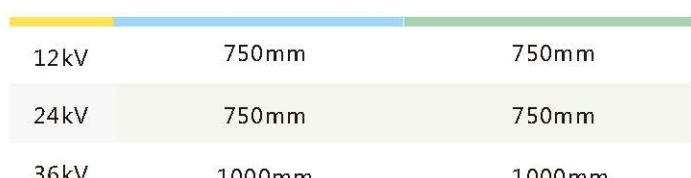
MXGN-□V

Circuit breaker unit width



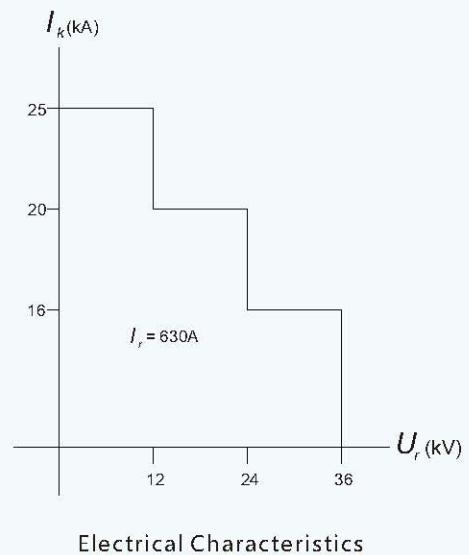
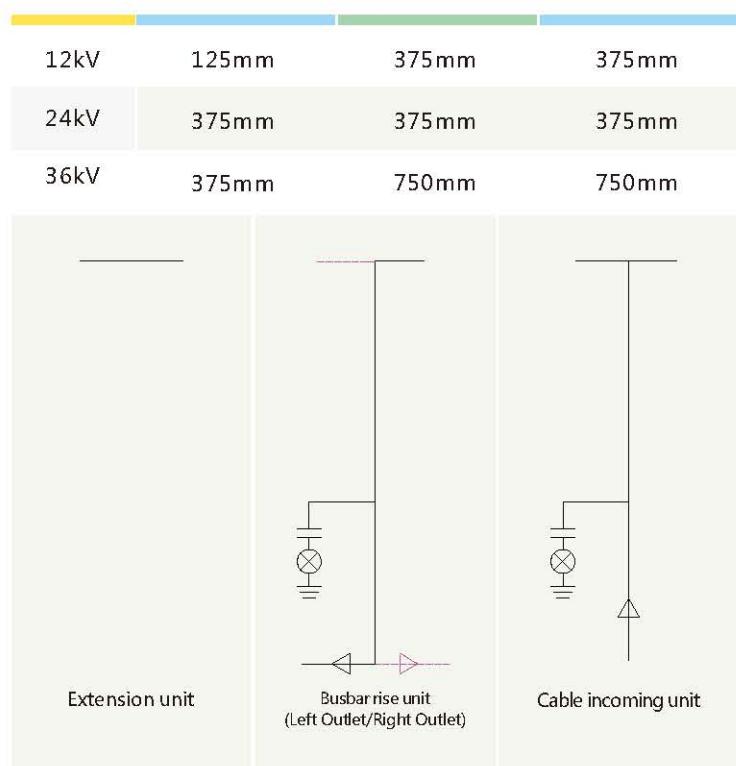
MXGN-□M

Metering unit width



MXGN-□D

Coupling Unit width

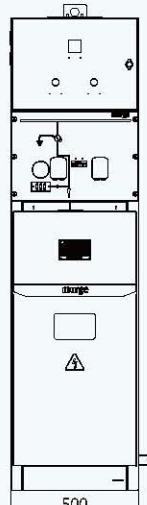


Dimension (MXGN-12)

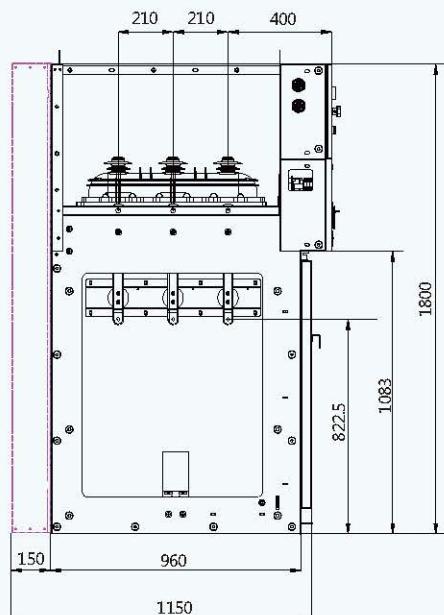
MXGN-12C Dimension



Config 1



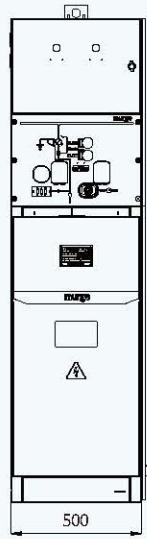
Config 2



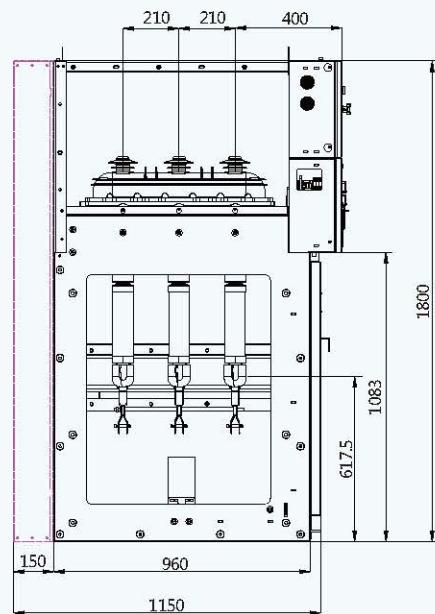
MXGN-12F Dimension



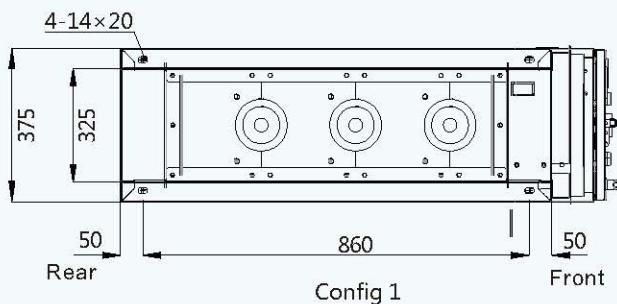
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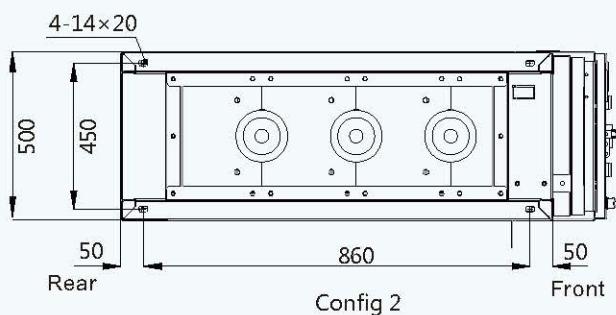
Config 2



Mounting Holes of MXGN-12 C/F unit



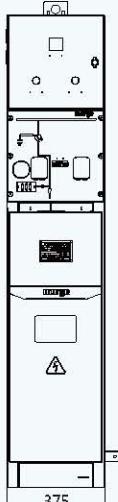
Config 1



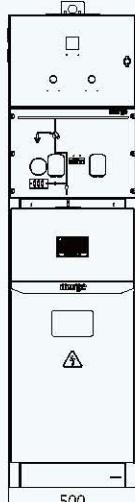
Config 2

Dimension (MXGN-24)

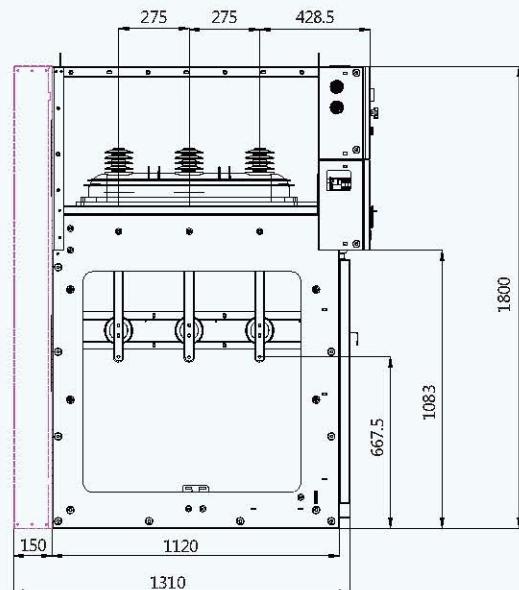
MXGN-24C Dimension



Config 1



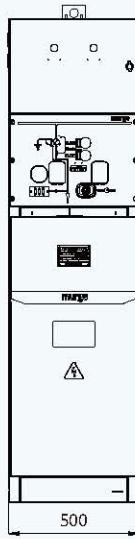
Config 2



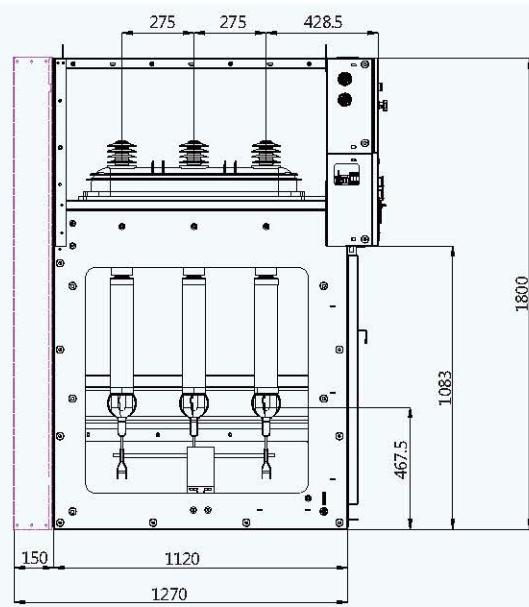
MXGN-24F Dimension



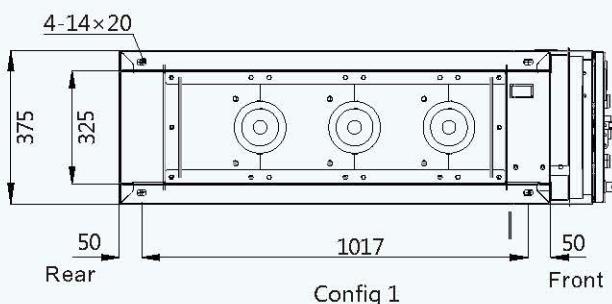
Config 1



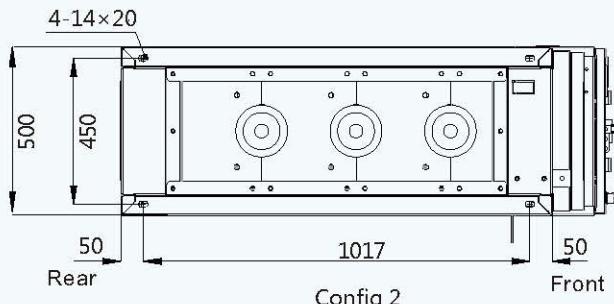
Config 2



Mounting Holes of MXGN-24 C/F unit



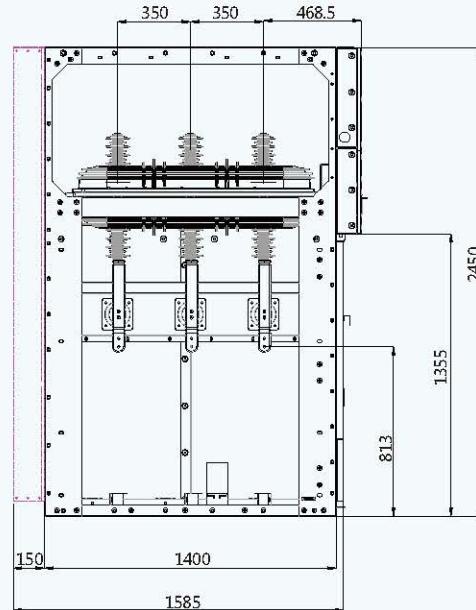
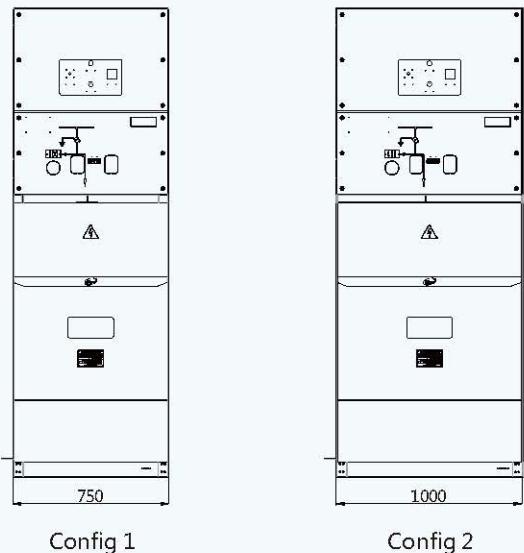
Config 1



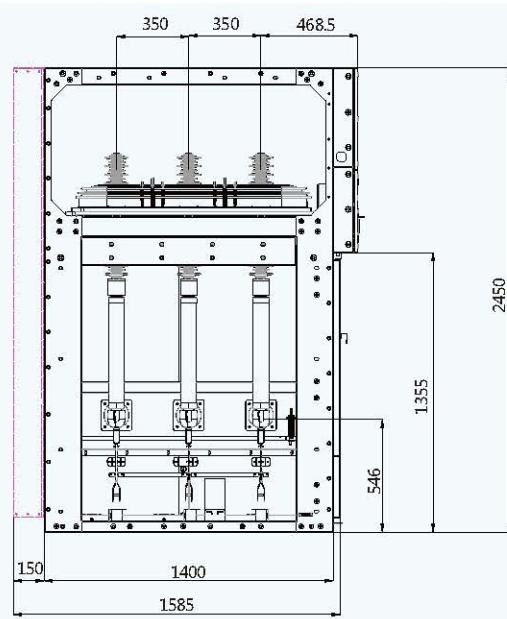
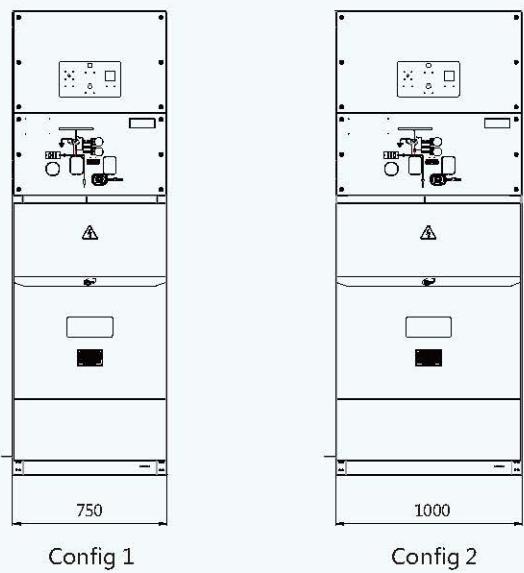
Config 2

Dimension (MXGN-36)

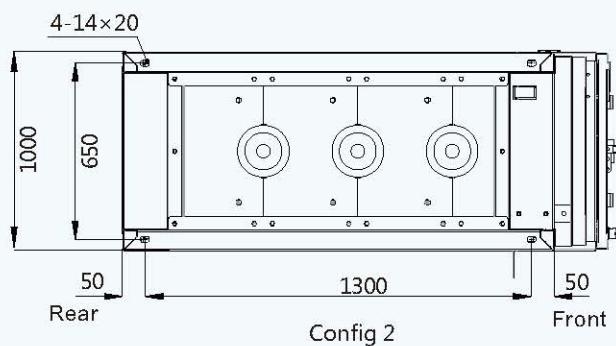
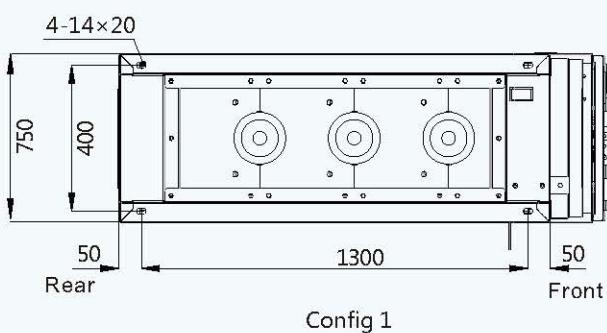
MXGN-36C Dimension



MXGN-36F Dimension



Mounting Holes of MXGN-36 C/F unit



Main Parts

FMG Series Load Break Switch

FMG series is a three-position load break switch select for MXGN series metal-enclosed switchgear. With rotary moving contactors as the main structure, the FMG adopts magnetic arc-extinguishing, and has reliable breaking and interlock performance. It is capable of breaking/making at rated current and making at short-circuit current.



VMG Series lateral Circuit Breaker

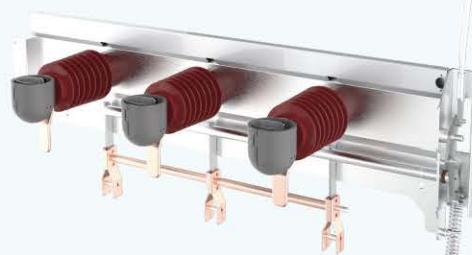
VMG series lateral circuit breaker is custom-designed for the MXGN series metal-enclosed switchgear. The circuit breaker adopts draw-out type and uses vacuum arc-extinguishing technology which has advantages of reliable interruption performance, long service life, maintenance-free and easy installation.

VMG series lateral circuit breaker is mainly applied to the MXGN series metal-enclosed switchgear. It is capable of breaking/making the circuit up to rated short-circuit current.



MGJ Series Earthing Switch

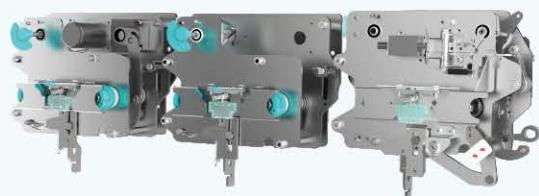
MGJ series earthing switch is applied to MXGN series metal-enclosed switchgear. It can bear 5.1kA peak short-circuit current twice. It can also protect switch-fuse unit if fitted with a fuse trip.



Operating Mechanism

The spring operating mechanism of the MXGN series switchgear features the following characteristics:

- Proprietary design.
- Durable spring operating mechanism.
- Clamping structure, resulting in high stability, high reliability and long service life.
- Compact design, bringing high mechanical efficiency.
- Highly anti-corrosive, as all parts of the operating mechanism have passed 96h salt spray test, ensuring reliable operation of products under severe conditions.
- Reliable integrated interlocking device to prevent mis-operation.



Product Series	C Manual	C Motorized	F Manual
FMG-12IS	✓	✓	
FMG-12QS		✓	

C Motorized Operating Mechanism

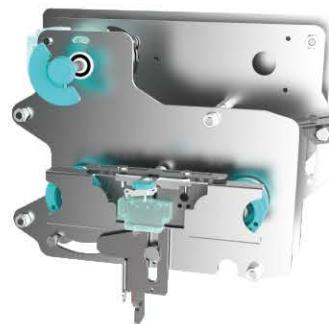
- Use operating handle or motor to open/close main switch
- Use the operating handle to open/close earthing switch
- Auxiliary contact



C Motorized Operating Mechanism

C Manual Operating Mechanism

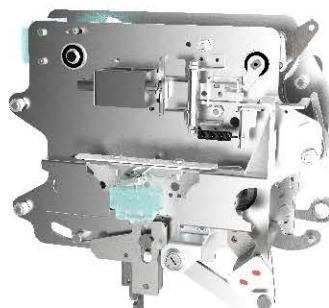
- Use the operating handle to open/close main switch
- Use the operating handle to open/close earthing switch
- Auxiliary contact



C Manual Operating Mechanism

F Manual Operating Mechanism

- Use the operating handle to open/close main switch
- Open push button, fuse trip system and shunt trip coil can trigger trip system and open LBS
- Use the operating handle to open/close earthing switch
- Mechanical fuse trip indication
- Manual trip
- Shunt trip coil



F Manual Operating Mechanism

Switch-fuse Combinations

XRNT fuse-links in compliance with IEC60.282.1 are selected for the protection of switch-fuse combinations in MXGN series switchgear. Please refer to the below table for coordination of fuses, switch and transformer.

Fuse selection table(A)																			
100%	Rated capacity of transformer (kVA)																		Fuse
<i>U_n(kV)</i>	25	50	100	125	160	200	250	315	400	500	630	800	1000	1250	1600	2000	2500	<i>U_r(kV)</i>	
3.3	16	25	40	50	50	80	80	100	125	125	160	200						7.2	
5	10	16	31.5	40	40	50	63	80	80	125	125	160							
5.5	10	16	31.5	31.5	40	50	50	63	80	100	125	125	160	160					
6	10	16	25	31.5	40	50	50	63	80	80	125	125	160	160					
6.6	10	16	25	31.5	40	50	50	63	80	80	100	125	125	160					
10	6.3	10	16	20	25	31.5	40	50	50	63	80	80	100	100	125	200	12		
11	6.3	10	16	20	25	25	31.5	40	50	50	63	80	100	100	125	160			
13.8	6.3	10	16	16	20	25	31.5	31.5	40	50	50	63	80	80	100	125	125	17.5	
15	6.3	10	10	16	16	20	25	31.5	40	50	50	63	80	80	100	125	125		
20	6.3	6.3	10	10	16	16	25	25	31.5	40	40	50	50	63	80	100	125		
22	6.3	6.3	10	10	10	16	20	25	25	31.5	40	40	50	50	80	80	100	24	
33	2	2	3.15	3.15	6.3	6.3	10	10	16	20	20	25	31.5	40	40	63	63	36	

Accessories

Motorized Module

In the MXGN series switchgear, for load break switch unit and switch fuse unit, the manual operating mechanism is standard configuration, and the motorized operating mechanism is optional according to requirements.



Motorized Module

Table for Main Technical Parameters of DC Motor

Model	220VDC	110VDC	48VDC	24VDC
Power	40W	40W	40W	40W
Speed	13r/min	13r/min	13r/min	13r/min

Manometer

To ensure safe operation, each gas tank of the MXGN series switchgear has a manometer to detect the gas pressure meeting technical requirements. Density relay with contacts is optional to realize low-pressure alarm.



Manometer

Auxiliary Contact

Auxiliary contact is used to indicate the position status of switchgear.

Auxiliary contact is an essential component in the switchgear as it inputs important signal to the control signal. Different configurations of the MXGN series switchgear can have corresponding auxiliary contacts as per user requirement.



Microswitch

Contact Rating of Auxiliary Contact

Model	AC12	AC15	DC12
Rated current	22A	6A	5A
Rated voltage	380VAC	380VAC	250VDC

Short-circuit and Earthing-fault Indicator

Preliminary fault analysis can be facilitated by installing short-circuit/earthing fault indicator.



Short-circuit and Earthing fault Indicator

Interlock

In MXGN series switchgear, a reliable interlock is fitted between circuit breaker switch and three position LBS, between load break switch and earthing switch, and a secure interlock is also placed between the earthing switch and the door of cable compartment. Only when the earthing switch is closed, can the door of the cable compartment be opened; but when the earthing switch is opened, the door of the cable compartment must be closed. This operation can effectively protect operators to open the door of cable compartment without residual charge risk so that safe fuse replacement, cable installation and other maintenance actions can be performed.

MXGN series switchgear can have an optional interlock device so that operation hole of earthing switch becomes inaccessible when incoming cable is live. At this time, the operating handle cannot be inserted into the handle hole to prevent misoperation and ensure personal and equipment safety.

Load Break Switch and Switch-fuse combination unit

- Switch closing operation is allowed only after closing the panel door then open earthing switch.
- Earthing is allowed only after switching open.
- Panel door can be opened only after switch earthed.
- Earthing switch can be operated only after switch is at the open position.

Circuit Breaker Unit

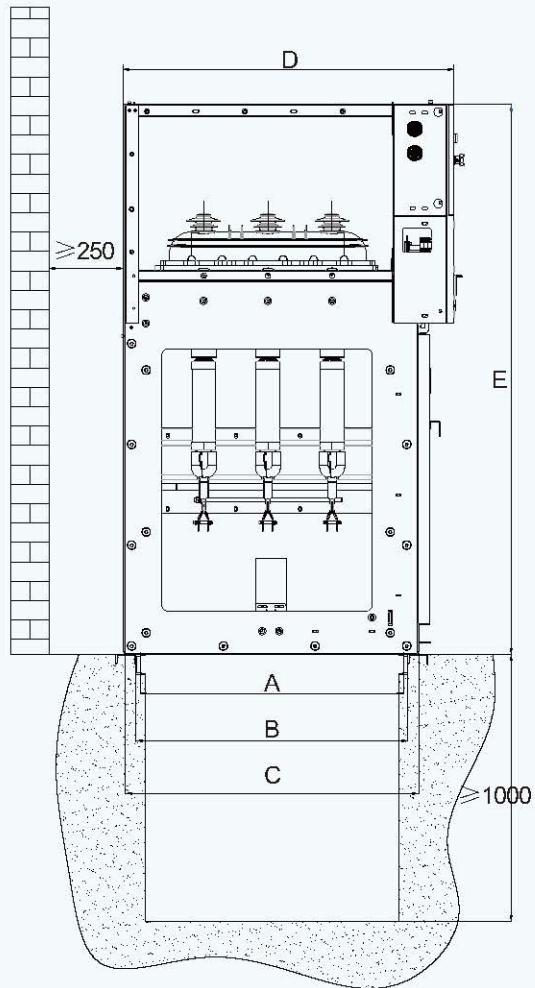
- LBS can be operated only after close cubicle door firstly and then open circuit breaker .
- Earthing switch can be closed only after open circuit breaker firstly and then open load break switch.
- Door opening conditions:
 - The circuit breaker is closed
 - The disconnector is open.
 - The earthing switch is close.

Notes:

Three position load break switch can be operated only when the circuit breaker is at the open position.

LV compartment

MXGN series switchgear is also equipped with LV compartment, which is installed at the front top of switchgear, used to install the control, monitor and indicator devices such as amperemeter, open/close button and switch state indicator, etc.



Cable duct Installation Drawing

	Width 1	Width 2	A(mm)	B(mm)	C(mm)	D(mm)	E(mm)
12kV	375	325	860	860	960	1075	1800
	500	450					
24kV	375	325	1117	1020	1120	1235	1800
	500	450					
36kV	750	400	1300	1300	1400	1520	2250
	1000	650					

