ALHAMAD
SWITCHGEAR

Medium Voltage
Ring Main Unit

17.5 kV, 630 A, 50/60 Hz, SF6
INSULATED

iRing

JEESM6 SERIES

MADE IN UAE

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Plugged into your needs

Al Hamad is the leading manufacturing enterprise specialized in Low voltage to Medium voltage electrical products.

Headquartered in Abu Dhabi, UAE, the company covers entire MENA region and provide expert solutions in view of the local environment, requirements and necessities.

With an extensive experience of more than 2 decades and a thorough knowledge on Low and Medium voltage products, the team at Al Hamad understand the increased demands of the products in upcoming years and worked collaboratively to manufacture and provide high quality solutions in utilities and many industrial applications.

The team is dedicated to providing Electrical Solutions to multiple sectors including utilities, Oil & Gas, Defense & infrastructure segment.

CONTENTS

PRODUCT INTRODUCTION

iRing family JEES M6 Ring main unit is factory-assembled, type-tested (KEMA, Netherlands according to latest IEC standards), 3-pole metal-enclosed single-busbar switchgear for Indoor and outdoor installation. This model is the principal unit in which two ring switches and a tee-off circuit breaker accompanied by a disconnector switch are contained in a common tank. The units are locally manufactured and assembled in production facilities in United Arab Emirates.

The ring switches are fault-make load-break enclosed in SF6 gas, with 3 operating positions: ON, OFF and EARTH. The circuit breaker operates on the proven rotating arc principle, comprises of vacuum interrupters and has 2 operating positions: ON & OFF. The disconnector switch is a fault-make load-break switch like the ring switch with ON, OFF & EARTH position.

All the mechanisms, like ring switch and circuit breaker, selector slots and operation slots are mounted outside the gas tank and therefore readily accessible. Access is protected by a hinged weatherproof & lockable door.

The range can be used in indoor/outdoor applications and is available in extensible, non-extensible and modular form to comply various application requirements.
All the switching functions are insulated with SF6 gas and sealed in a stainless-steel tank of grade 316L with an ingress protection of IP-67, thereby limiting any leakages. The structural tank welding ensures high reliability with a very high product life expectancy.

The housing is treated using galvanized sheet steel and in-house oven cured painting after 6 stage pretreatment process to withstand degradation from severe climatic conditions.

PRODUCT FEATURES

I. TECHNOLOGY FEATURES:

- 17.5 kV and 630 Amps ratings
- Metal enclosed unit for indoor/outdoor installation & type tested.
- Developed according to latest international standards (2018).
- VCB Equipped with Vacuum interrupters of ABB make.
- Switch disconnector to earth tee-off part of the unit.
- Ring switch & disconnector enclosed in a SF6 gas insulated stainless steel tank (grade 316L), sealed for life.
- Ring switches & disconnector switches are all 3 position switches (ON/OFF/EARTH).
- Integrated earth and test facility for easy and safe cable test.
- Auxiliary powered relay protection available.
- Optional Actuators (motorized) for circuit breaker & ring switches.
- Ideal integration with DMS network for remote operation and control
- 100% safe to operate in powered up condition.
- Clear indication of operation status via mimic diagram on front panel.
- Voltage presence detector to check the presence of voltage in the cables.
- Safety interlocked operation mechanisms with optional padlock facility.

II. DURABILITY & USEFULNESS

- Stainless steel enclosed tank is hermetically sealed, which means that the tank is independent of environmental effects such as dirt, small insects, and moisture and so on.
- All switching operations can be made safely to personnel with the interlocking system that operates automatically according to the switch position by the operator.
- Individual units and unit blocks can be freely combined and extended.

III. SAFETY FEATURES

Operational Interlocks

Mechanical Interlocks are a part of the ring switches, disconnector and circuit breaker operation. The major interlocks present are as follows:

- Prevent operation of switches and circuit breaker from ON to EARTH ON position.
- Opening of all testing access and cable box covers only in EARTH ON position.
- EARTH ON to EARTH OFF only after closing testing access and cable box covers.
- Prevent breaker ON when earth links applied.
- Prevent earth link application when breaker ON.

Additionally, padlocking facilities are available to prevent operation of breaker, ring switch, disconnector switch & earth switch.

Cable Earthing & Testing – Ring Switch

Cable test access cover is operational only when the corresponding switch is in EARTH ON position. The test bushings are earthed with an earth link copper bar arrangement which needs to be removed for cable tests. Without any need to remove the main cables, those can be tested for faults. Whenever the test access is open, interlocks are present to restrict the operation of ring switch to ON.

Cable Earthing & Testing – Circuit Breaker

Cable test access cover is operational only when the disconnector switch is in EARTH ON position. The test bushings are earthed with an earth link copper bar arrangement which needs to be removed for cable tests. Without any need to remove the main cables, those can be tested for faults. Whenever the test access is open, interlocks are present to restrict the operation of breaker to ON.

Cable Box

Considering operator safety, cable box has interlock to allow access only when the switch is in the EARTH ON position. Cable boxes are positioned at the rear end (tee-off connection) and both lateral side (ring-switch). Whenever the cable box is open, interlocks are present to restrict the operation of the functions to ON.

Internal Arc Withstand

JEES M6 units are available in AFL (front & lateral) internal arc rated for breaker chamber and AFL internal arc rated for cable chambers to guarantee personal and equipment safely in any event of internal faults.

Voltage Presence Indicator

VPI (Voltage Presence Indication) system is a feature in the JEES M6 RMU. The VPI Indicate the presence of voltage in the unit by the means of inbuilt voltage divider connected to cable bushings.

Gas Pressure Indicator

Gas pressure indicator is a feature in the JEES M6 RMU. They are fitted to the tank and indicates red and green zones for acceptable ranges of pressure. Additional changeover contacts are available for remote alert in the event of gas fail.

APPLICATIONS

APPLICABLE STANDARDS

- iRing family JEES M6 Ring Main Unit is tested according to following IEC-standards:
-
- IEC 62271–1: Specifications High-voltage switchgear
- IEC 62271-100: Alternating-current circuit-breakers
- IEC 62271-102: Alternating current disconnectors earthing switches
- IEC 62271-103: High-voltage switches
- IEC 62271-200: Arc fault and switchgear
- IEC 60529: Degrees of protection provided by enclosures

OPERATING CONDITIONS

- IP54-outdoor installation (no kiosk required)
- Average temperature for 24 hours: 40°C
- Ambient temperature for proper working: -25°C to 60°C
- Insulation medium: SF6 Gas
- Interruption medium: Vacuum

Dielectric Performance

Short-Circuit Performance

Switching Performance

Temperature-Rise Performance

Switching Compartment Internal Arc Performance

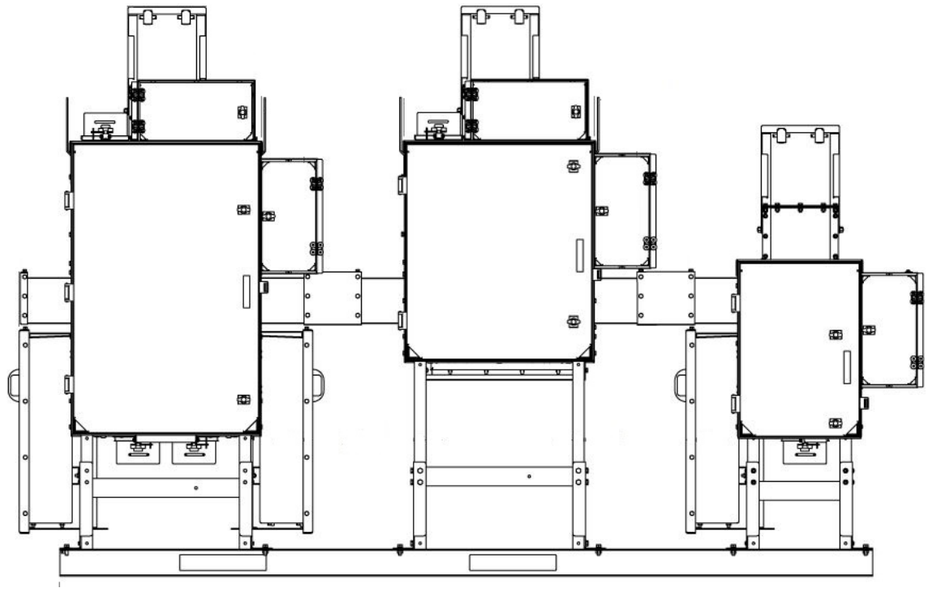
Cable Compartment Internal Arc Performance

RMU EXTENSIBLE FEATURE

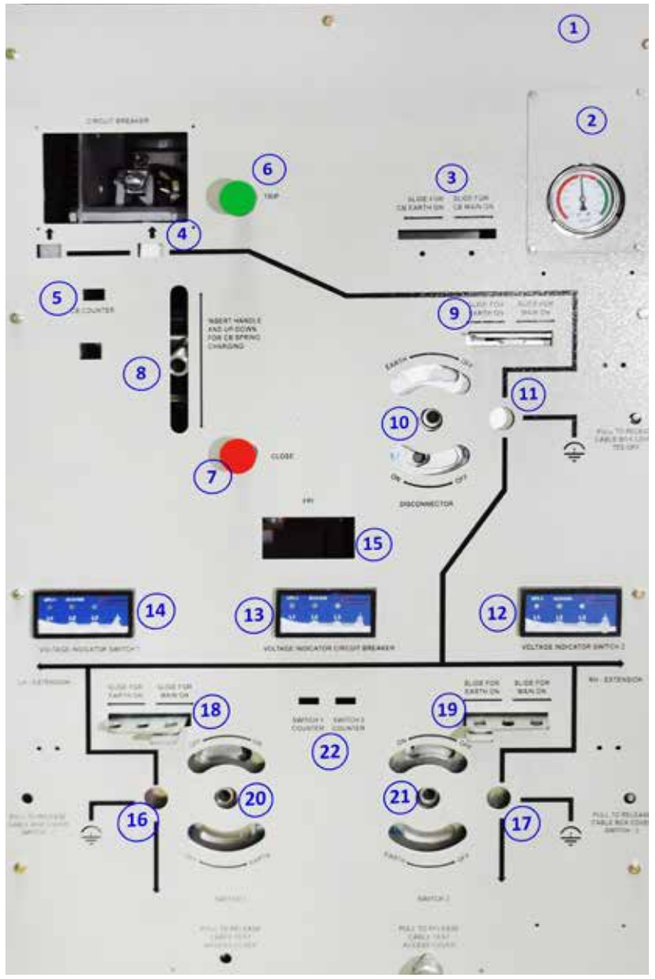
The extensible feature of the iRing is effective when there is a requirement of functional unit to be added on the right, left or both sides of RMU. Whenever any load adds up in the future, this feature gives you a flawless solution for dealing with the extra load in an easy way. The units can be easily installed on site without any modification on the existing unit and no specific tools are required.

The RMU parts that assists in extension as shown below:

EXTENSION BUSHINGS



EXTENSION ARRANGEMENT OF DIFFERENT UNITS



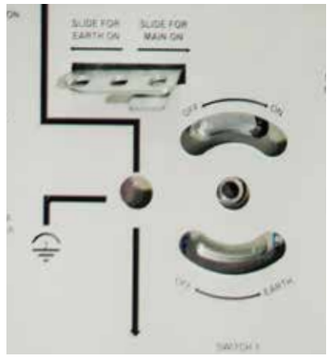
I. PRODUCT REPRESENTATION

RMU parts labeled as below:

1. Fascia / front panel
2. SF6 Pressure Indicator
3. Circuit Breaker Slider
4. Circuit Breaker Indicator
5. Circuit Breaker Operation Counter
6. Circuit Breaker Trip/Off
7. Circuit Breaker Close
8. CB Spring Charge Operation Slot
9. Disconnector Selector Slider
10. Disconnector Operation Slot
11. Disconnector Indicator
12. Switch-2 Voltage presence Indicator
13. Circuit Breaker Voltage presence Indicator
14. Switch-1 Voltage presence Indicator
15. Fault Passage Indicator / Earth Fault Indicator
16. Switch-1 Position Indicator
17. Switch-2 Position Indicator
18. Switch-1 Selector Slider
19. Switch-2 Selector Slider
20. Switch-1 Operation Slot
21. Switch-2 Operation Slot
22. Switch 1 & 2 Operation Counter

II. RING SWITCH

- Three function-ON, OFF & Earth with spring loaded mechanism and rotary moving shaft.
- Manual & optional Electrical operation
- Sliding interlocked selector with optional padlocking facility for choosing Mains ON or Earth ON position.
- Single line mimic diagram with clear indication of switch position (ON, OFF or Earth position).
- Fully interlocked with cable box for earth and test facility.
- Operations counter indicator.
- Ring switch mechanism are equipped with safety interlocks to protect the user & equipment from any unintentional operation.
- Optional Padlock facility.

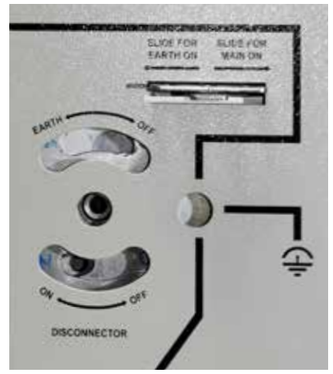


III. VACUUM CIRCUIT BREAKER

- Two function-ON & OFF spring-loaded mechanism
- Manual & optional Electrical operation
- Sliding interlocked selector with optional padlocking facility for choosing CB and disconnector switch operation.
- Interlocked operating sliders, one for breaker ON/OFF & other for disconnector selection in Mains/Earth
- 'Push to Operate' mechanical push button for CB CLOSE & CB TRIP operation.
- Single line mimic diagram with clear indication of switch position (ON, OFF or Earth position).
- Fully interlocked with cable box for earth and test facility.
- Operations counter indicator.
- CB switch mechanism is equipped with safety interlocks to protect the user & equipment from any unintentional operation.
- CB springe charge slot and indication available.
- Protection function in the form of relay (customer specific).

IV. DISCONNECTOR SWITCH

- Three function-ON, OFF & Earth spring loaded mechanism, independent manual operation.
- Mechanism with rotary moving shaft for switching ON/OFF position and EARTH/OFF position.
- Sliding interlocked selector with padlocking facility for selecting Mains or Earth ON position.
- Provision to EARTH the tee-off connection when disconnector is at EARTH ON
- Single line mimic diagram with clear indication of switch position (ON, OFF or Earth position).
- Disconnector switch mechanism are equipped with safety interlocks to protect the user & equipment from any unintentional operation.



V. VPIS

- VPIS (Voltage Presence Indication System) is provided for Ring switch & Circuit Breaker feeders.
- VPIS receives a voltage signal through the voltage divider built into the cable bushings.

VI. SF6 PRESSURE INDICATOR

- A gas pressure indicator is fitted to the tank which has green and red sectors with pressure value of SF6 gas to indicate the acceptable ranges of pressure.

VII. FPI/EFI

- Fault Passage Indicators (FPI) / Earth fault indicators (EFI) are used for rapid location and isolation of faults on medium voltage networks in open loop ring main networks.

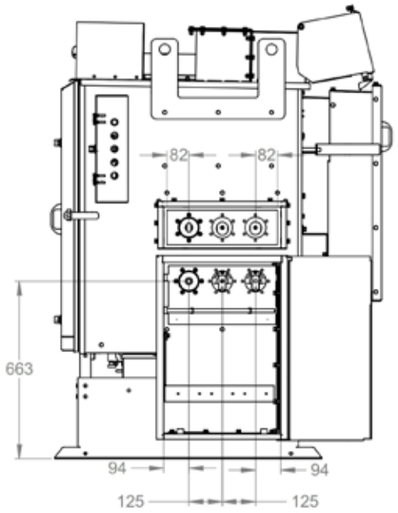
TECHNICAL DATA

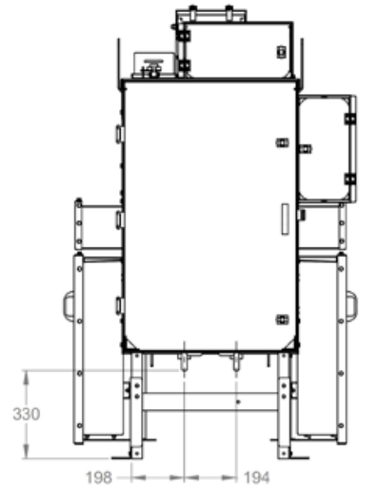
JEES M6 RMU

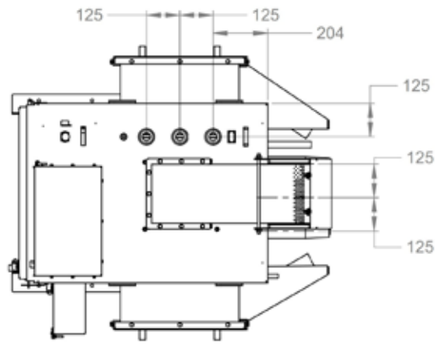
Rated Values		
Voltage	kV	17.5
Impulse withstand voltage	kV	95
Power frequency withstand voltage	kV	38
Frequency	Hz	50/60
Short-time withstand current 1 s.	kA	25
Busbar System		
Normal Current (@ 40° C)	A	630
Short-time withstand current 1 s.	kA	25
Vacuum Circuit Breaker		
Normal Current (@ 40 ° C)	A	630
Short-circuit making current peak	kA	54.6
Short-circuit breaking current	kA	21
Short-time withstand current 1 s.	kA	25
Ring switch		
Normal Current (@ 40 ° C)	A	630
Short-circuit making current peak	kA	54.6
Short-circuit breaking current	kA	21
Short-time withstand current 1 s.	kA	25
Disconnector Switch		
Normal Current (@ 40 ° C)	A	630
Short-circuit making current peak	kA	54.6
Short-circuit breaking current	kA	21
Short-time withstand current 1 s.	kA	25
Electrical Endurance		
VCB	E2	
Ring Switch	E1(15.5kV,50Hz), E1(17.5kV,60Hz)	
Mechanical Endurance		
VCB	M1(2000)	
Ring Switch	M2(5000)	
General Data		
Degree of Protection (Overall Unit)	IP-54	
Degree of Protection (Tank with HV Parts)	IP-67	
Material of Construction	Galvanized Sheet Steel / Enclosure Stainless Steel-Tank	
Base plate thickness	mm	3
Wall, Roof & Door thickness	mm	2
SF6 gas pressure (@ 20° C)	bar	0.4

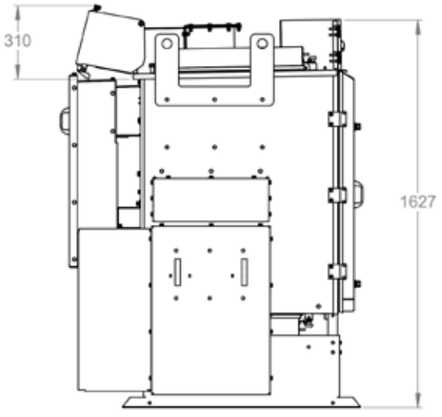
DIMENSIONAL DETAILS

(ALL DIMENSIONS IN ‘MM’)



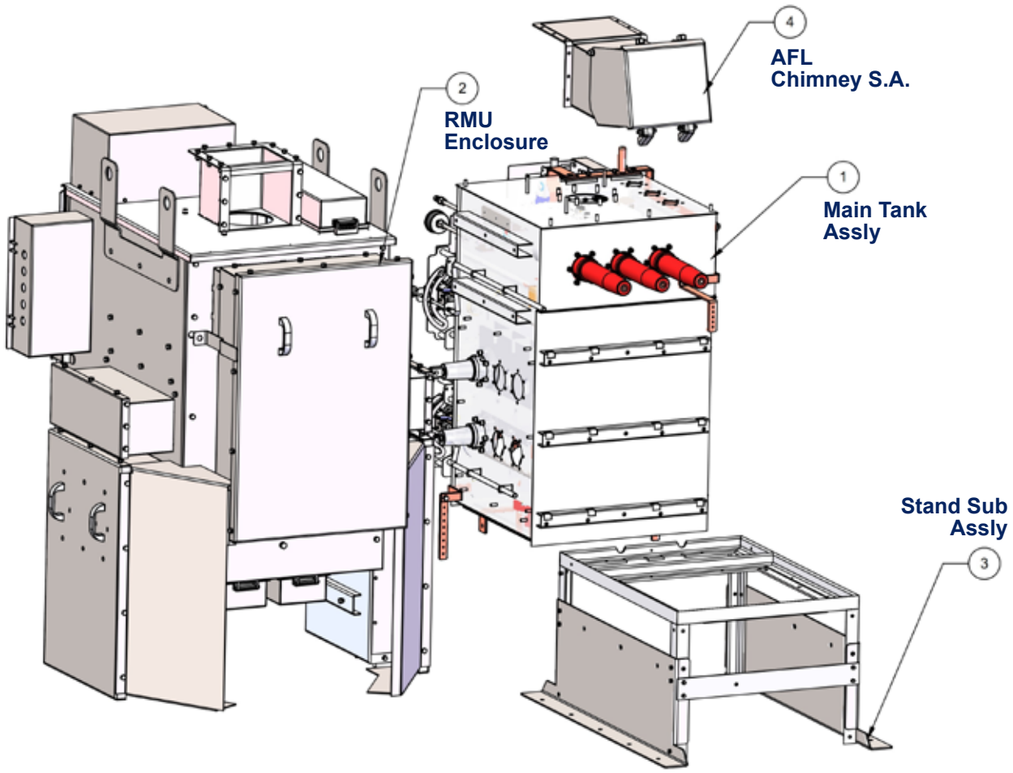


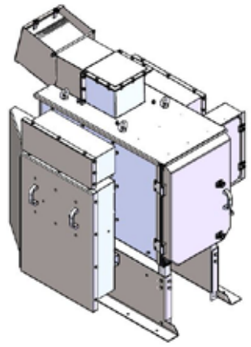




PRODUCTS

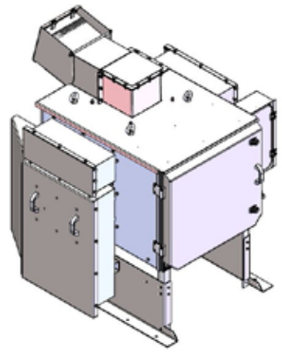
JEES M6 RMU





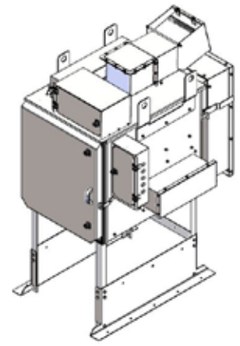
Single RING SWITCH

Rated Voltage: 17.5 kV
Rated Current: 630 A
Frequency: 50/60 Hz
Internal Arc Classification:
AFL 21 kA/1s
Insulation Medium: SF6



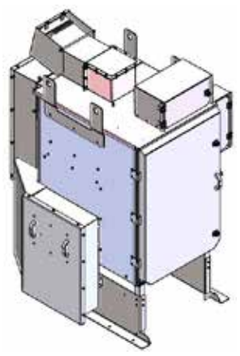
Double RING SWITCH

Rated Voltage: 17.5 kV
Rated Current: 630 A
Frequency: 50/60 Hz
Internal Arc Classification:
AFL 21 kA/1s
Insulation Medium: SF6



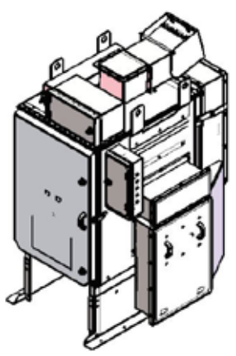
Single VCB + Disconnector

Rated Voltage: 17.5 kV
Rated Current: 630 A
Frequency: 50/60 Hz
Internal Arc Classification:
AFL 21 kA/1s
Insulation Medium: SF6



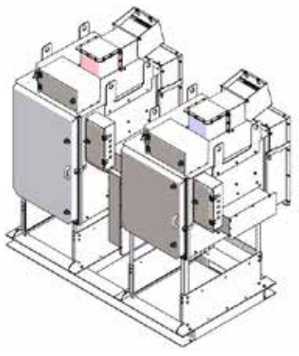
Non-Extensible 2+1

Rated Voltage: 17.5 kV
Rated Current: 630 A
Frequency: 50/60 Hz
Internal Arc Classification:
AFL 21 kA/1s
Insulation Medium: SF6



Extensible 2+1

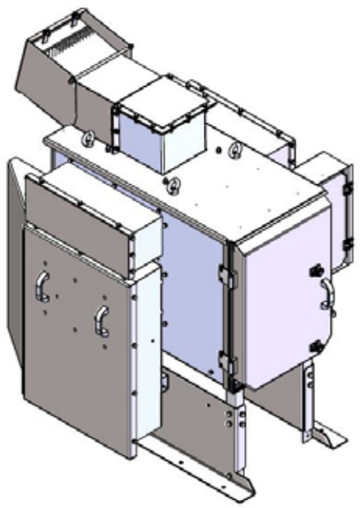
Rated Voltage: 17.5 kV
Rated Current: 630 A
Frequency: 50/60 Hz
Internal Arc Classification:
AFL 21 kA/1s
Insulation Medium: SF6

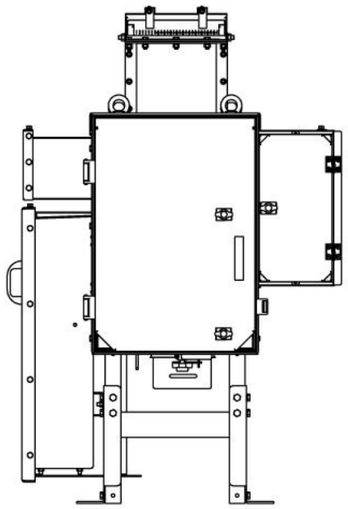


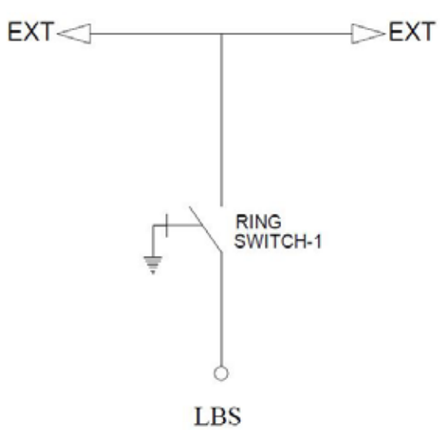
Extensible 2+2

Rated Voltage: 17.5 kV
Rated Current: 630 A
Frequency: 50/60 Hz
Internal Arc Classification:
AFL 21 kA/1s
Insulation Medium: SF6

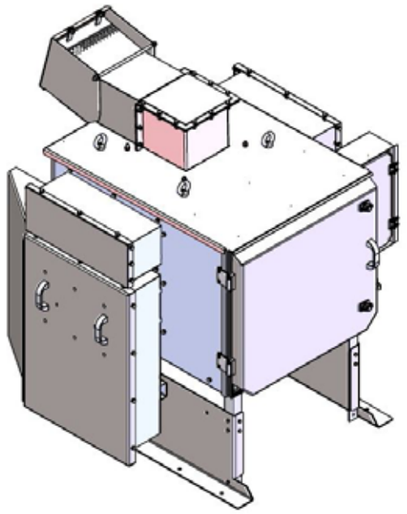
SINGLE RING SWITCH

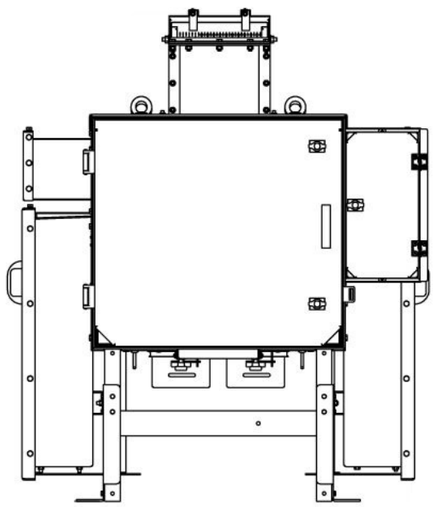


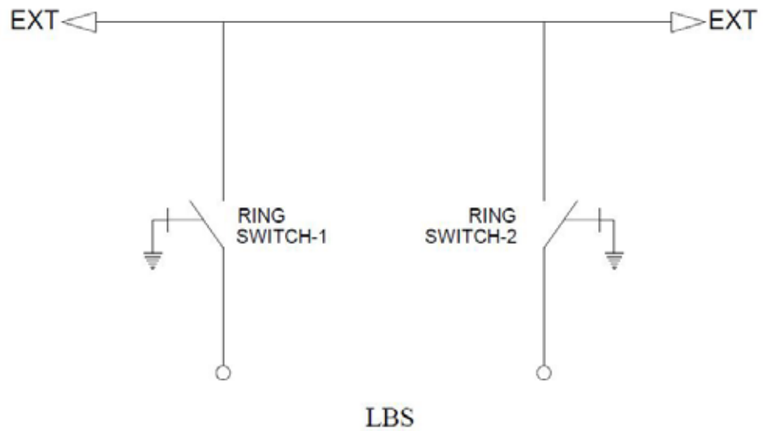




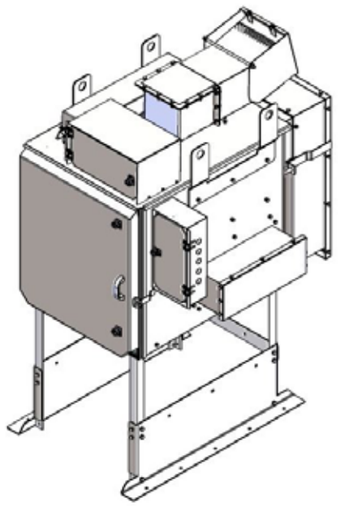
DOUBLE RING SWITCH

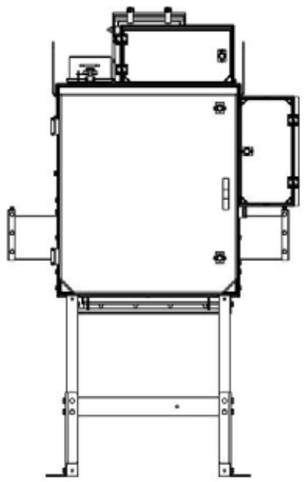


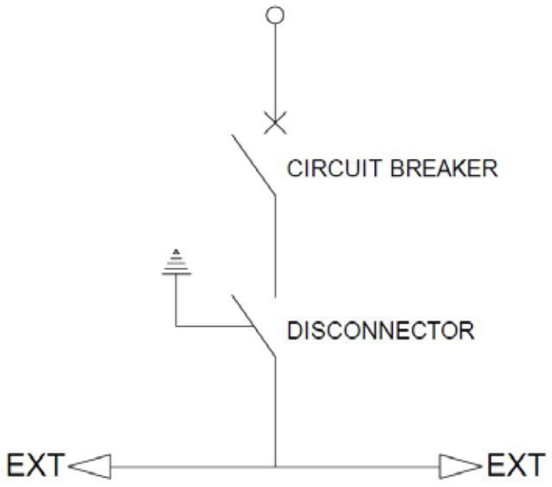




SINGLE VCB + DISCONNECTOR







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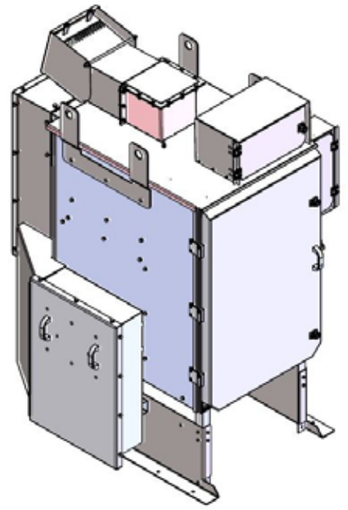

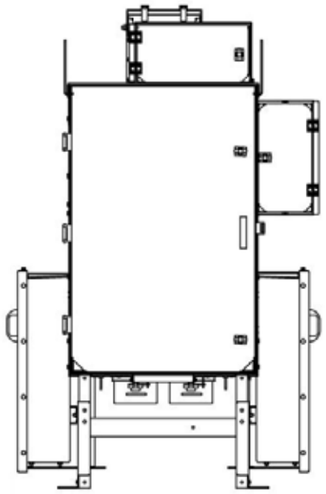

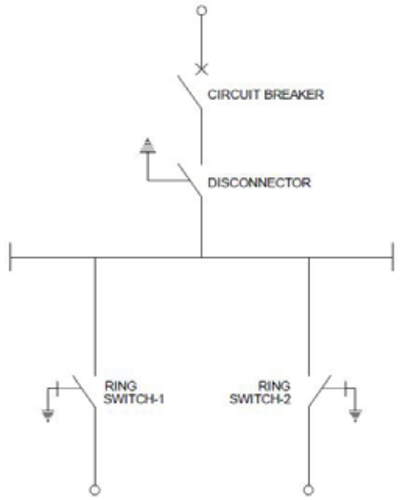

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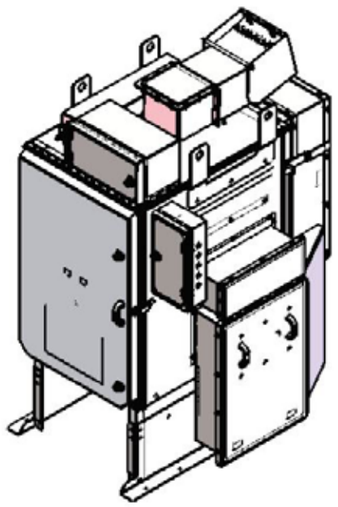
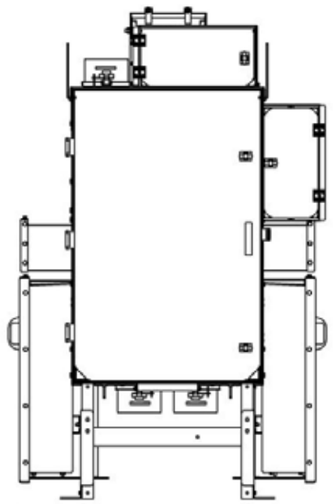
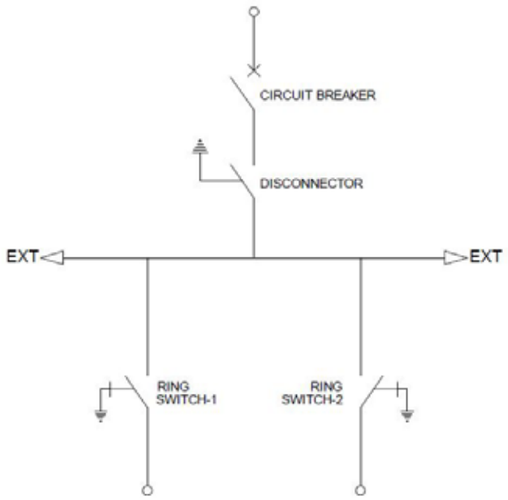
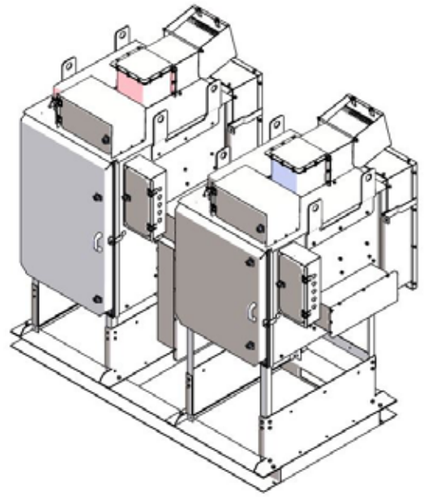
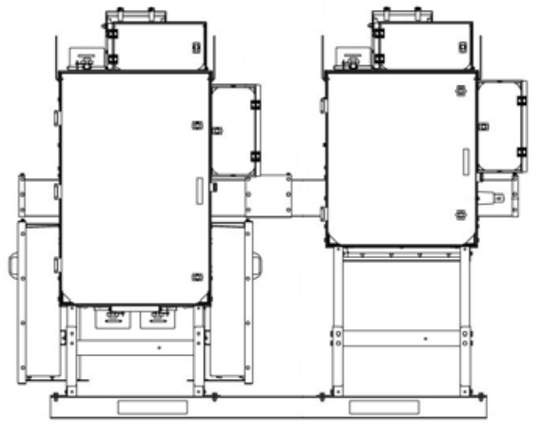


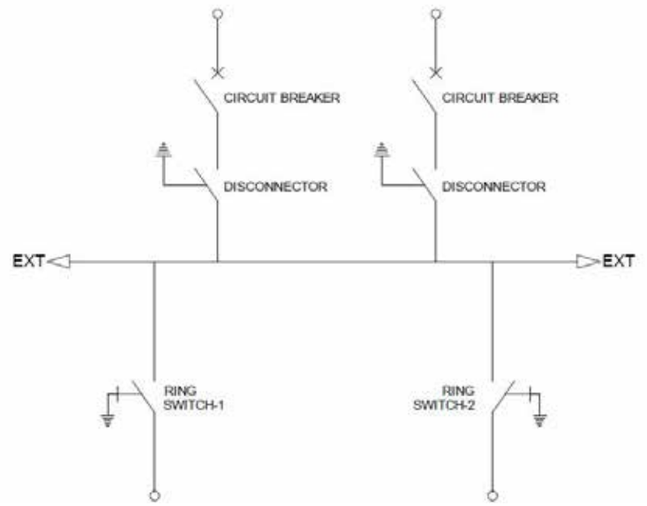




EXTENSIBLE (2+2)







ALHAMAD
SWITCHGEAR

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