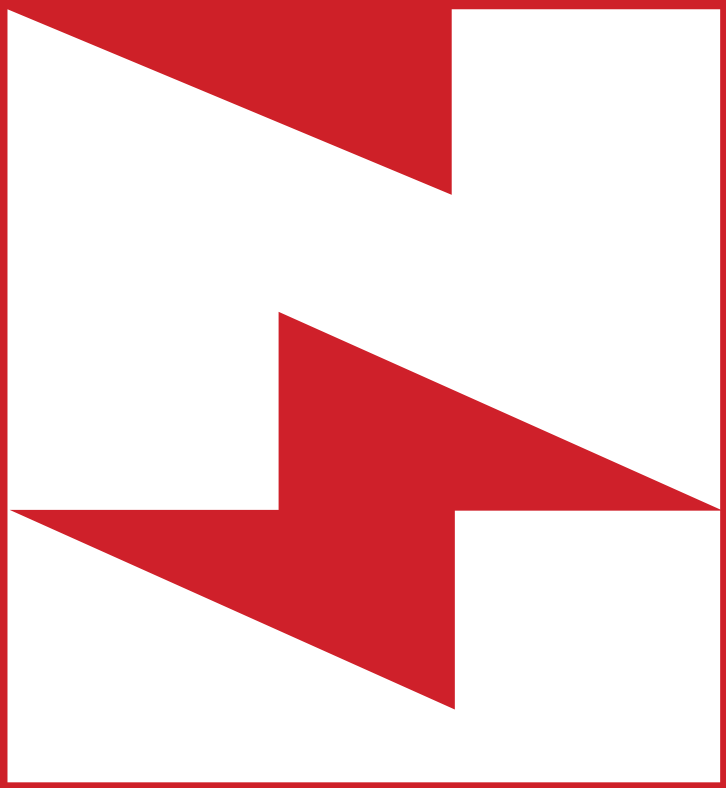
MVairO ON

Medium Voltage Switchgear
ON Series



ONA Electric Industries

ON Series

COMPLETE **SWITCHGEAR** SOLUTIONS FROM A SINGLE SOURCE.

TABLE OF CONTENT

Description

01

01. Description

MVairO switchgear is a high-quality, compact electrical system used for safely and efficiently distributing medium voltage power in industrial and commercial settings. It offers advanced protection, control, and monitoring features, making it a reliable choice for modern power systems.

Features

02

02. Features

Product features

01.

Robust and Durable

Circuit breakers with polyamide poles offer exceptional mechanical and electrical strength, capable of handling high breaking currents.

02.

Advanced Safety

Innovative safety features protect personnel and equipment while minimizing environmental impact.

03.

Intelligent Monitoring

Real-time data analysis optimizes equipment performance, extends maintenance intervals, and reduces costs.

02. Features

Product features

04.

Efficient Thermal Management

Advanced cooling technology ensures optimal operating temperatures.

05.

Proven Safety and Reliability

Rigorously tested to withstand extreme conditions and maintain insulation integrity.

06.

Optimized Design

Enhanced electrical performance and reduced maintenance requirements.

02. Features

Customer features

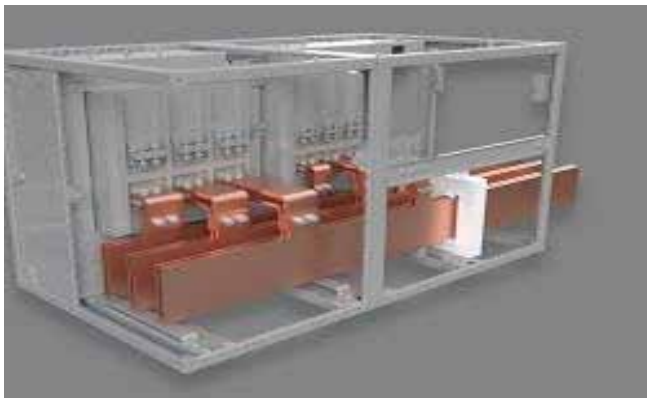
- Compliance & Standards
- Cost effectiveness
- Remote Monitoring & Control
- Customization &Flexibility
- Reliability
- Ease of Maintenance
- Longevity & Durability

02. Features

Design features

01 Compartments

MVairO units contain compartments for circuit breakers, busbars, cables, and auxiliary equipment. Metallic barriers separate these sections. Arc-resistant models include gas evacuation ducts.



02 Main busbars

The busbar compartment holds copper conductors connecting to the circuit breaker. For currents up to 1250 amps, flat busbars are used.

03 Cable connections

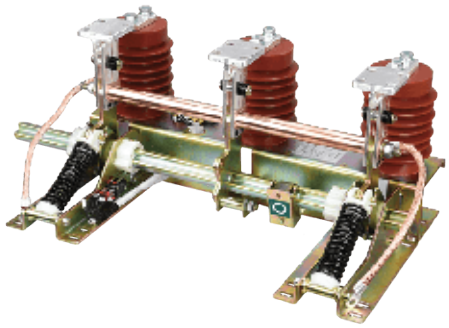
The busbar compartment holds copper conductors connecting to the circuit breaker. For currents up to 1250 amps, flat busbars are used.

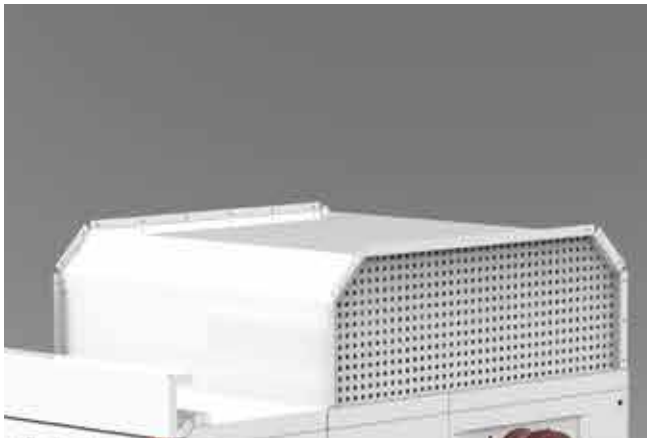
02. Features

Design features

04 Earthing switch

An earthing switch can be installed in the cable or busbar compartment for grounding purposes. It can handle short-circuit currents and is manually or motor-operated from the switchgear front.





05 Gas exhaust duct

A gas exhaust duct runs above the switchgear. Pressure from electrical faults opens flaps on compartments, releasing gases into the duct for safe evacuation.

06 Insulating bushings & shutters

The insulating bushings in the circuit-breaker compartment contain the contacts for connection of the
circuit-breaker with the busbar compartment and cable compartment respectively.

Applications

03

04. Applications

MV VCBs are indispensable in electrical utility substations where they safeguard transformers, generators, and other vital equipment from electrical disturbances. By rapidly isolating fault-induced sections, these devices enhance power grid reliability and stability.

02 Industrial Facilities

Industries characterized by heavy electrical loads, such as manufacturing, chemical processing, and steel production, rely on MV VCBs to protect and control their electrical distribution systems. These devices contribute to equipment longevity and uninterrupted operations.

03. Applications

03

Renewable Energy Plants

Wind farms, solar power plants, and other renewable energy facilities leverage MV VCBs to manage fluctuating power output and mitigate fault risks. These breakers ensure reliable switching and protection for both power generation and transmission.

04

Commercial Buildings

Large commercial establishments, data centers, and hospitals employ MV VCBs to maintain a secure and uninterrupted power supply. By preventing electrical disruptions that can lead to significant downtime, these devices protect critical operations.

03. Applications

05

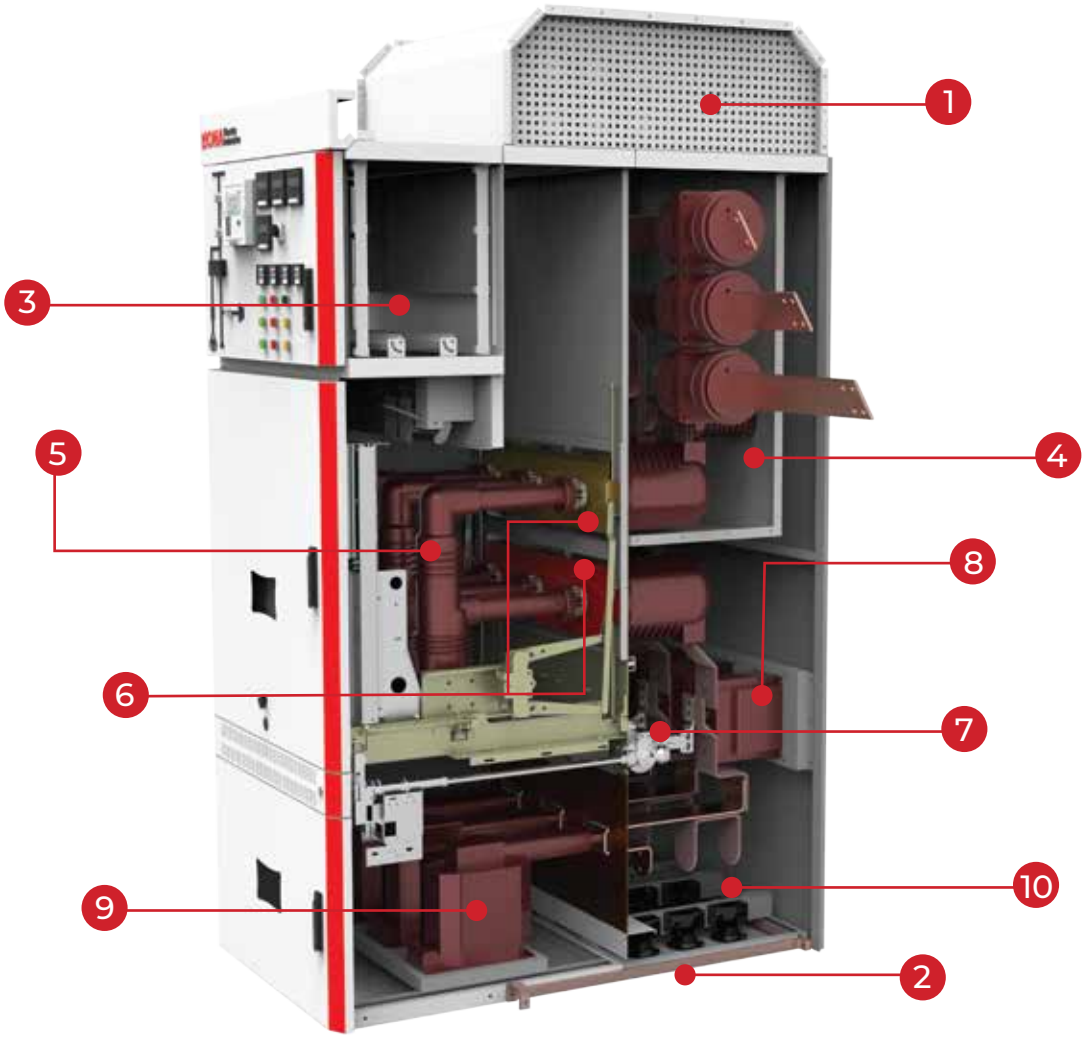
Transportation Systems

Railway systems, airports, and other transportation infrastructure depend on MV VCBs to manage and safeguard their electrical power systems. These breakers contribute to the overall safety and efficiency of these critical services.

Technical specifications

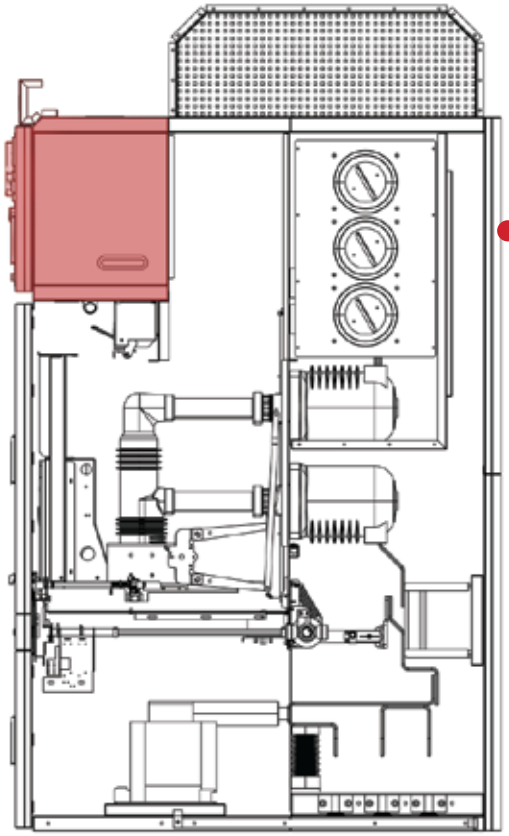
04

04. Technical specifications



1- Internal ARC Chambre
2- Earthing Busbar
3- LV Compartment
4- Busbar Compartment
5- VCB Compartment
6- Shutter of VCB lugs
7- Earthing Switch
8- Current Transformer
9- Potential Transformer
10- Cable Compartment

04. Technical specifications

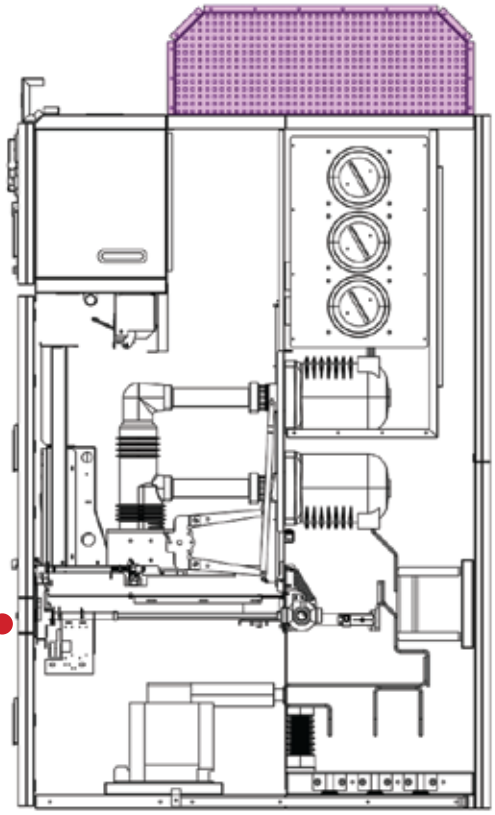


L.V Compartment

- Contains all distributor controls.
- It has a protection relay that protects the panel from electrical faults

Internal Arc Chamber

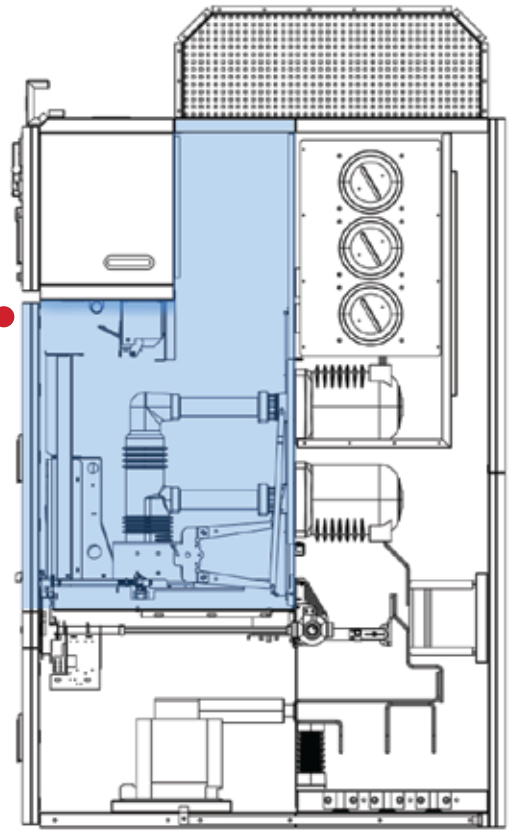
- It is considered a piping system for internal arc

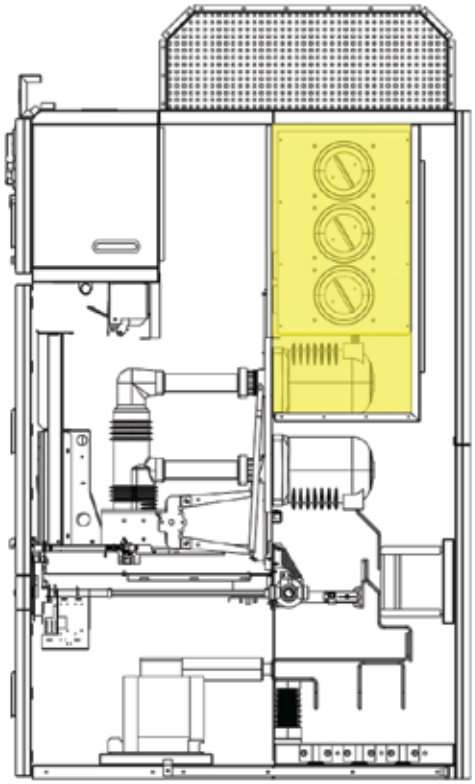


04. Technical specifications

VCB Compartment

- It contains a withdrawable vacuum circuit braker responsible for separating and operating electricity.

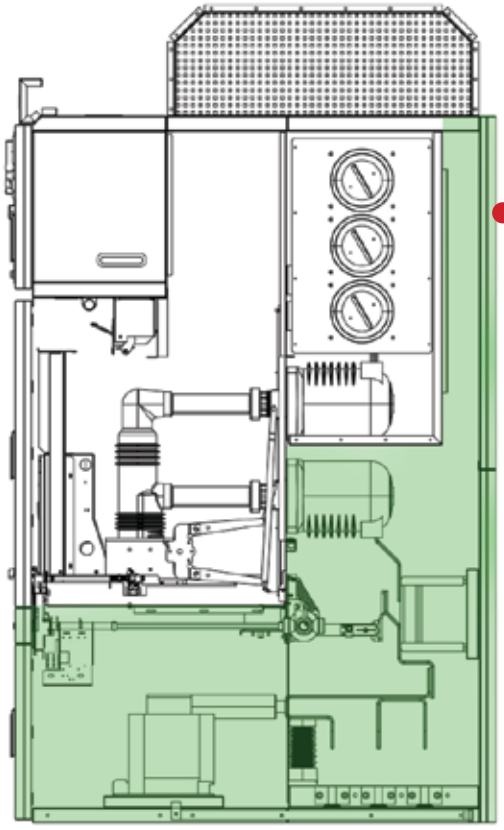




Busbar Compartment.

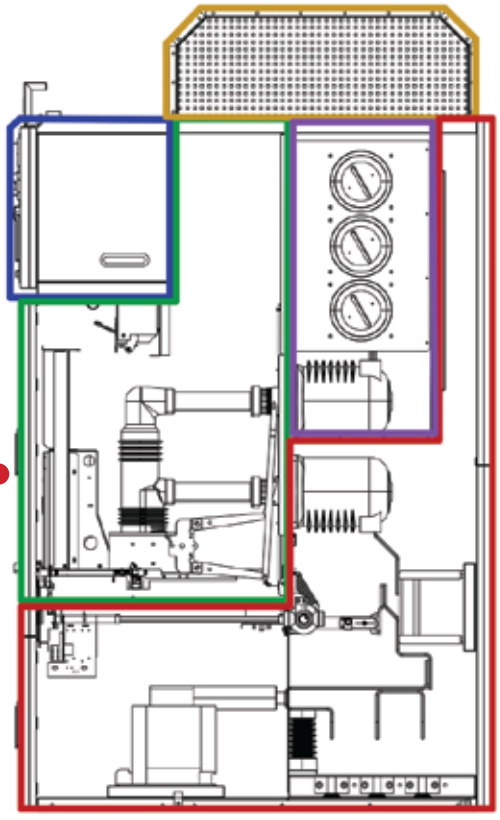
- It contains copper connection from cell to cell and from the breaker to the main busbar.

04. Technical specifications



Cable Compartment

- It contains CT & PT
- It has a place for connecting cables.



MVairO

- All parts of the switch gear are easy to assemble and maintain

04. Technical specifications

MVairO is medium voltage switchgear with a metal enclosure, suitable for indoor installations. Metal partitions segregate the compartments from each other and the live parts are air-insulated. The main technical characteristics are shown as follows:

Key technical specifications for the RST are detailed below :

OPP MV Switchgear		RST12		RST24	
Standards	IEC 62271-200				
Rated Voltage	Ur (KV)	12		24	
Rated Insulation Voltage	Us (KV)	28		50	
Impulse withstands voltage (BIL)	Up (KV)	75		125	
Rated frequency	Fr (HZ)	50		50	
Rated normal current (40 °C)	Ir (A)	630	1250	630	1250
Rated short-time withstand current (4 s)	(KA)	25	25	25	25
		31.5	31.5	31.5	31.5
Maximum overall dimensions	H (mm)	2370		2370	
	W (mm)	800		1000	
	D (mm)	1600		1600	

05

Product types

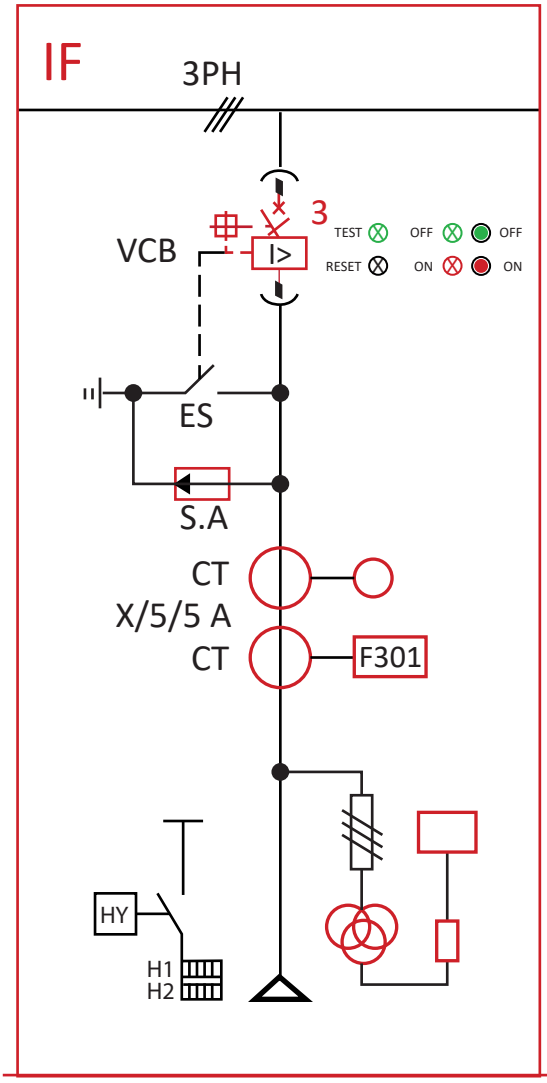
05. Product types

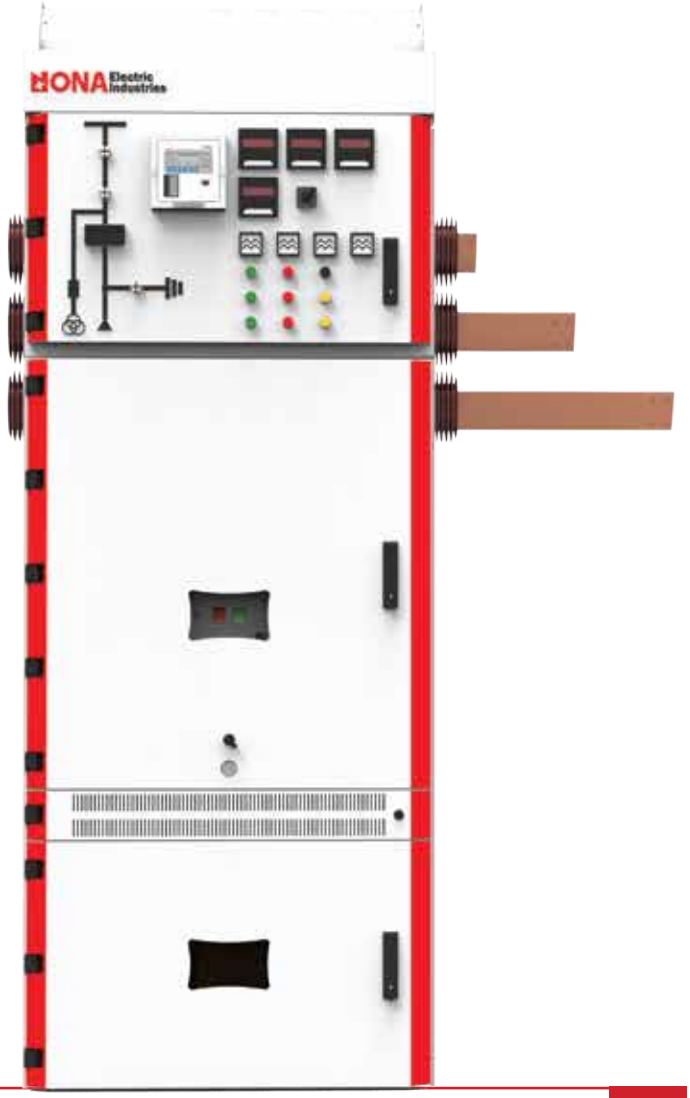
Incoming feeder

The Incoming Feeder in medium voltage switchgear is responsible for bringing electrical power from the utility or a higher voltage source into the switchgear system. It typically includes circuit breakers, disconnect switches, and protective relays that ensure safe and reliable power distribution. The Incoming Feeder must be robustly designed to handle the maximum expected load and provide protection against faults and overloads.

Rated voltage (KV)	Width (mm)	Depth (mm)	Height (mm)
12	800	1600	2400
24	1000	1600	2400

Optional equipment: KWH & Power meter





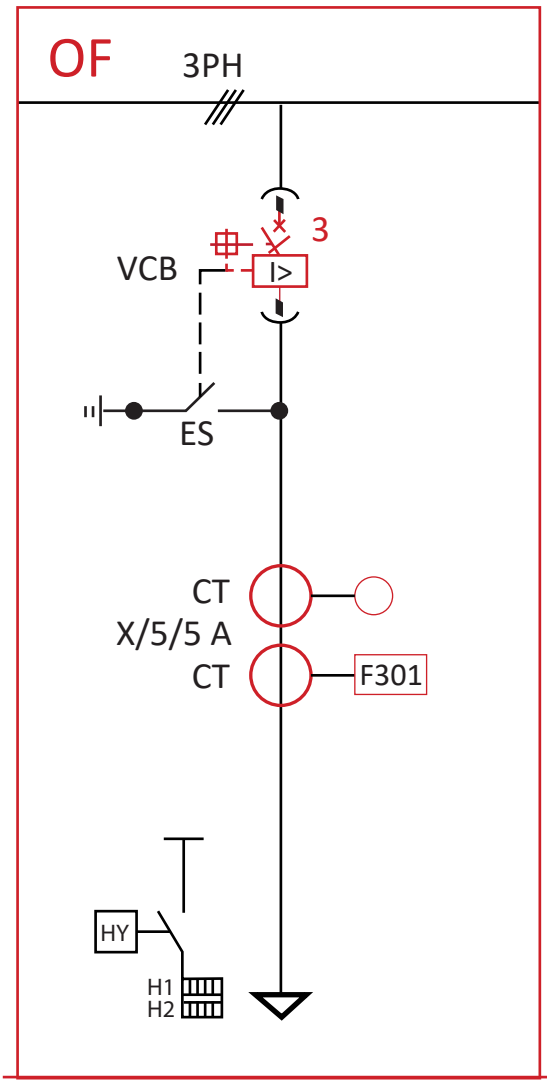
05. Product types

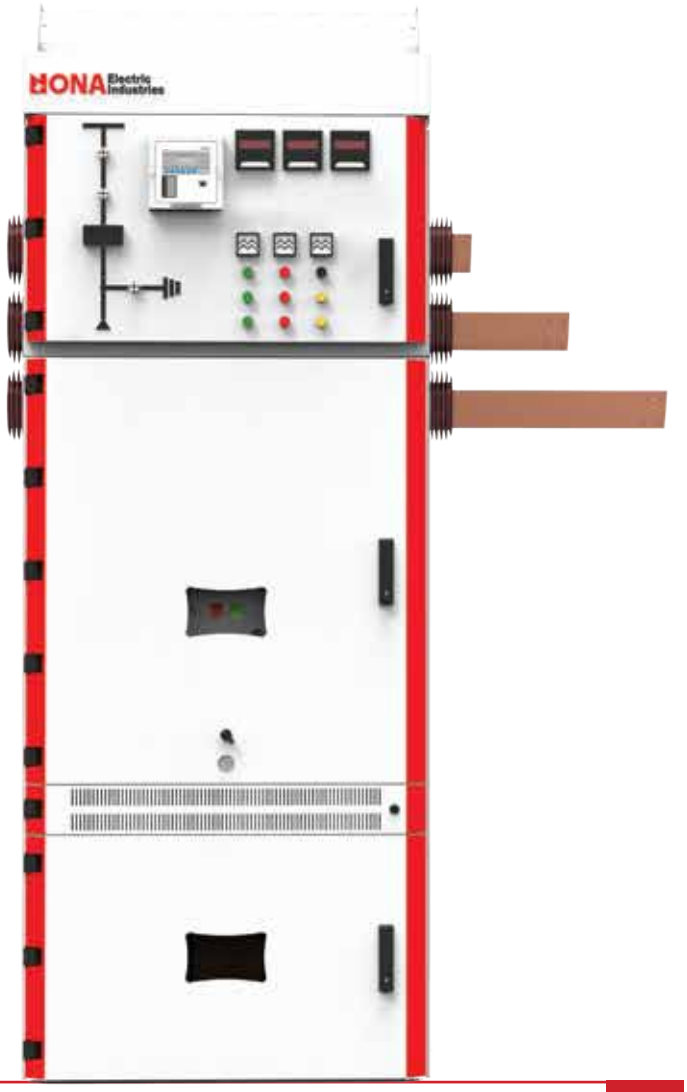
Outgoing feeder

The Outgoing Feeder distributes electrical power from the switchgear to various loads or sub-circuits within the facility. It connects the switchgear to the end-users and is equipped with circuit breakers or fuses to protect against short circuits and overloads. Proper coordination and protection settings are essential to ensure selective tripping and minimize downtime in case of a fault.

Rated voltage (KV)	Width (mm)	Depth (mm)	Height (mm)
12	800	1600	2400
24	1000	1600	2400

Optional equipment: KWH & Power meter





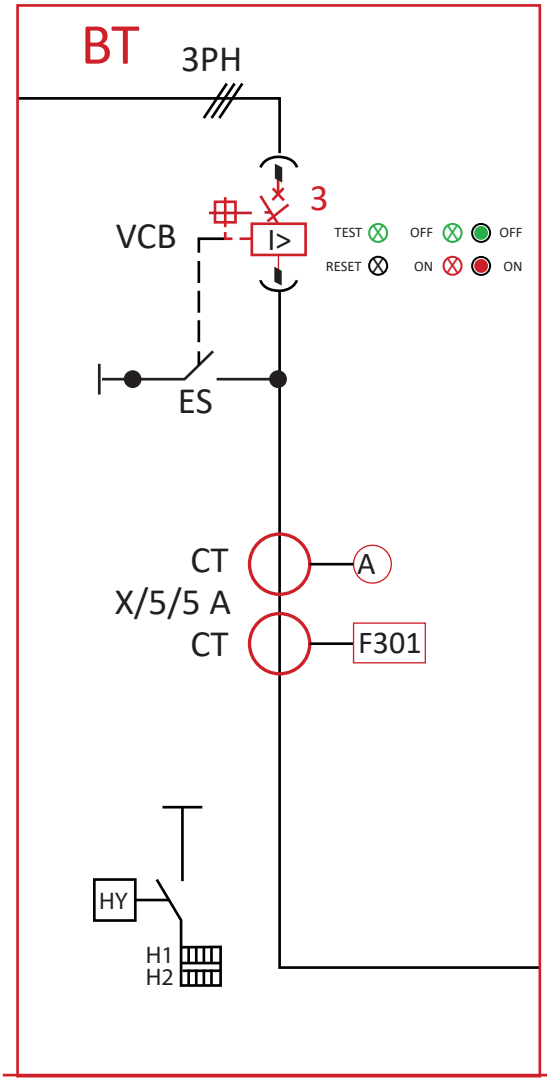
05. Product types

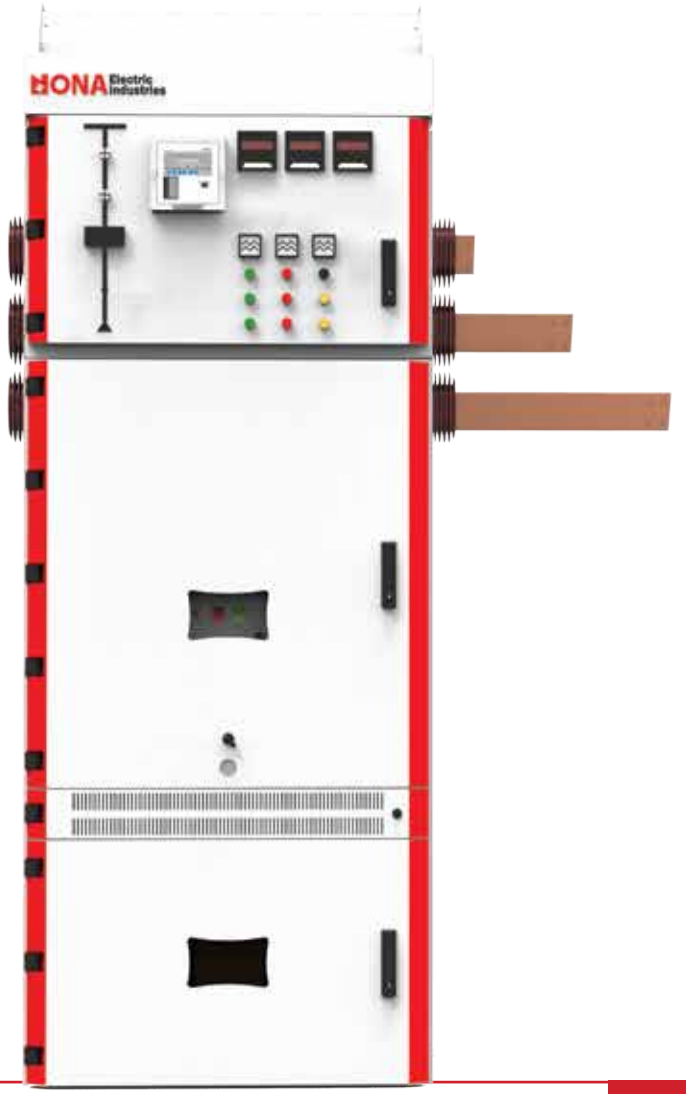
BUS Tie

The Busbar, often referred to as Bustier, is a critical component that acts as a common conductor for distributing electrical power between different parts of the switchgear. It consists of a metal conductor or several conductors housed in a protective enclosure. The busbar system is designed to handle high current loads and provide a low-resistance path for electrical distribution. Its design ensures efficient power transfer and minimizes electrical losses

Rated voltage (KV)	Width (mm)	Depth (mm)	Height (mm)
12	800	1600	2400
24	1000	1600	2400

Optional equipment: KWH & Power meter



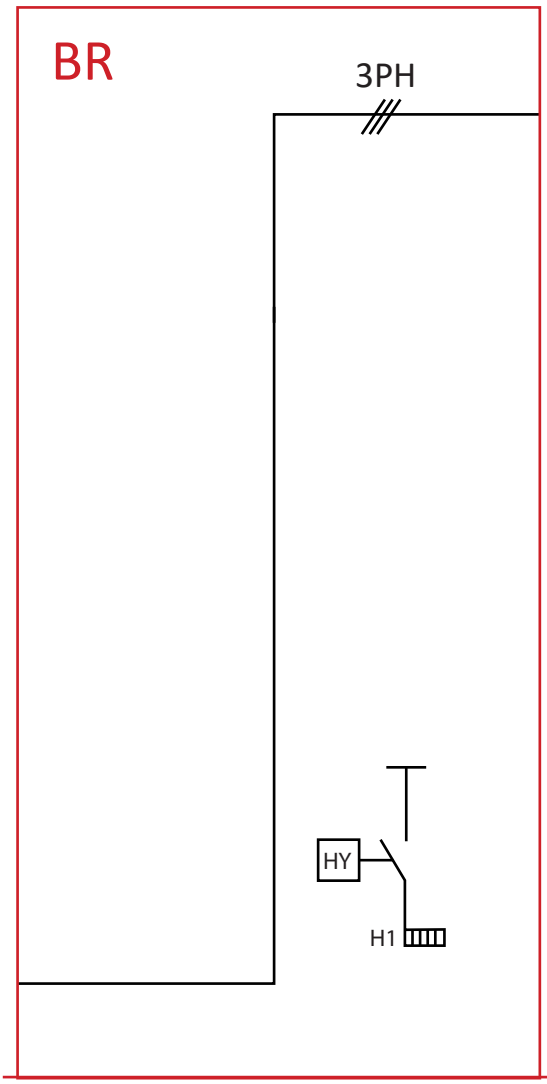


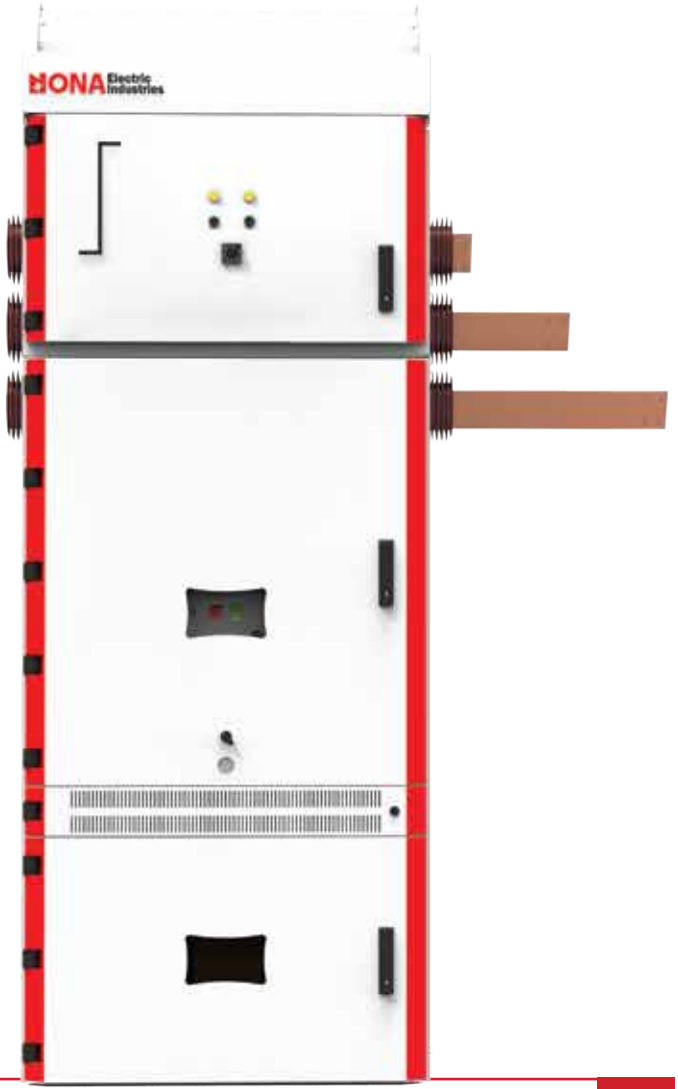
05. Product types

BUS Riser

The Bus Raiser is a component that vertically connects different levels or sections of switchgear. It is used to transfer power from one level to another, facilitating the connection between incoming feeders and outgoing feeders or between different busbar sections. The bus raiser ensures that the electrical distribution system remains compact and efficient while maintaining the required electrical and thermal performance.

Rated voltage (KV)	Width (mm)	Depth (mm)	Height (mm)
12	800	1600	2400
24	1000	1600	2400





Tested to the Extreme

05. Tested to the extreme

Our MVairO undergoes comprehensive testing to ensure the highest levels of safety and performance. This testing adheres to strict international (IEC) and local standards.

Maximizing Efficiency

To ensure consistent quality across our entire range, we perform in-depth tests on the most critical switchgear units. These successful results are then applied to validate the performance of the entire product line.

Tailored for Your Needs

Each MVairO unit receives a final set of functional checks at our factory. These tests are customized to the specific requirements of your installation, guaranteeing optimal operation upon delivery.

05. Tested to the extreme

MVairO switchgear has passed all required safety and performance tests set by international (IEC) and local standards. Every unit undergoes rigorous quality checks before leaving our factory to ensure it meets specific installation needs.

Our testing process utilizes two key stages:

IEC type tests

These rigorous tests, conducted by independent laboratories according to international (IEC) and local standards, will evaluate the switchgear's ability to withstand extreme conditions. Once completed, these tests will assess the switchgear's performance under various scenarios, including those most susceptible to stress. The results will then be confidently applied to the entire product range. Some key type tests that will be conducted include :

Short-circuit and peak withstand current

Verifies the switchgear's ability to handle high currents without damage, ensuring protection for both the main power circuits and earthing systems.

Temperature rise

Ensures the switchgear operates within safe thermal limits under rated current conditions.

05. Tested to the extreme

Internal arc capability:
Confirms the integrity of the switchgear enclosure during internal faults, preventing personnel injury and equipment damage.

Dielectric test
Guarantees the switchgear's resistance to lightning strikes and power frequency voltage fluctuations.

Making and breaking capacity
Evaluates the circuit breaker's ability to handle both normal currents and interrupting short circuits safely.

05. Tested to the extreme

Factory Routine Tests

Each MVairO unit undergoes a series of rigorous inspections and functional checks at our factory before delivery. These tests verify proper assembly, ensure compliance with specific installation requirements, and guarantee optimal performance.
Routine tests typically include:

Visual inspection &check

Mechanical sequence operations

Cabling check

Electrical sequence operations

05. Tested to the extreme

- Circuit Resistance Test
- Voltage Withstand Test
- Secondary insulation test
- Electrical sequence operations

This comprehensive testing program ensures that MVairO is built to the highest standards and delivers unmatched performance and peace of mind.

Safety

07

06. Safety

The MVairO is designed and rigorously tested to prioritize the safety of personnel in the event of an internal arc fault.
An internal arc, can occur due to various reasons :

Causes of an internal arc

Component degradation

Insulation defects can develop over time due to harsh environmental conditions or pollution.

Power Surges

Voltage spikes from lightning strikes or equipment malfunctions can trigger an arc fault.

Human Error

Improper installation, tampering with safety interlocks, or inadequate maintenance practices can increase the risk.

Overheating

Loose connections, corrosion, or the presence of foreign objects can cause overheating and lead to an arc fault.

Animal Intrusion

Small animals entering the switchgear can cause a short circuit

06. Safety

The energy produced by the internal arc causes the following phenomena:

Increase in the internal pressure

Increase in temperature

Visual and acoustic effects

Mechanical stresses on the switchgear structure

Melting, decomposition & evaporation of materials

06. Safety

Rigorous internal arc testing ensures the safety of UniGear RST switchgear. During these tests, the equipment is subjected to extreme conditions to verify the following:

Containment

The switchgear's enclosure prevents the ejection of components and the escape of flames or hot gases, even under extreme pressure.

Personnel Safety

The switchgear's housing remains intact, protecting personnel from harm during and after a fault.

Grounding Integrity

The earthing system remains functional, safeguarding personnel accessing the switchgear post-fault.

06. Safety

Internal Arc Classification (IAC)

MVairO is tested and classified according to the IAC standard, which guarantees personnel safety regardless of access:

General classification: IAC (Internal Arc Classified)

- **Accessibility**

  A, B, or C (depending on personnel access)

  A -> Accessible only to authorized personnel
  B -> Accessible to everyone
  C -> Not accessible due to installation

- **Access directions**

  F -> Front
  L -> Sides
  R -> Rear

- **Test values**

  Current (kA) and duration (seconds) of the internal arc

Interlocks

08

07. Interlocks

MVairO incorporates industry-standard mechanical interlocks, ensuring proper operation sequence compliance with IEC regulations.

Standard safety interlocks (mandatory)			
Types		Description	Condition to be met
1	A	VCB racking-in/out	VCB in open position
	B	VCB Closing	Defined truck position
2	A	VCB racking-in	VCB multi-contact plug plugged
	B	VCB multi-contact plug unplugging	Truck in test position
3	A	Earthing switch closing	Truck in test position
	B	VCB racking-in	Earthing switch in open position
4	A	VCB compartment door opening	Truck in test position
	B	VCB racking-in	VCB compartment door closed
5	A	Cable compartment door opening	Earthing switch in ON position
	B	Earthing switch opening	Cable compartment door closed

06

Main devices

08. Main devices

1 - ECONA: The Reliable Choice for MV Applications

The ECONA vacuum circuit breaker (VCB) is specifically designed to excel in demanding applications requiring exceptional reliability and minimal maintenance.

VCB technology offers inherent advantages, including:

- Unmatched Durability :
  Vacuum construction ensures exceptional longevity and resistance to wear and tear.
- Superior Arc Quenching :
  The vacuum environment allows for efficient arc interruption, enhancing safety and performance.

Optimized for Medium Voltage Systems

The ECONA VCB seamlessly integrates with MVairO medium voltage switchgear, adhering to rigorous industry standards.

This ensures:

Perfect Compatibility : Guaranteed suitability for medium voltage applications.

- Enhanced Safety & Performance: Leverages the combined strengths of VCB technology and RST switchgear design.

08. Main devices

2. The Core of Reliable Control : Current Transformer

Our MVairO switchgear utilizes a high-accuracy indoor insulator type current transformer (CT) for exceptional measurement performance. Key features of the CT include:

- **Wide Voltage Range :**
  Supports system voltages from 12 kV to 24 kV, offering versatility for various medium voltage applications

- **High-Fidelity Performance:**
  - Directional Core :
    The primary and secondary coils are wound on a high permeability directional core with a short magnetic path. This design ensures accurate current transformation and minimizes signal distortion.

  - Epoxy Encapsulation : The entire assembly of the primary, secondary, and ground coils is encapsulated with silica-filled epoxy resin. This encapsulation provides superior electrical characteristics by preventing moisture ingress and enhancing mechanical strength.

Benefits for Your Operations :

- Accurate Data for Control Systems : The precise measurements provided by the CT ensure reliable data for your control and protection systems, enabling optimal system performance.
- Long-lasting Reliability : The epoxy encapsulation safeguards the CT from environmental factors, extending its lifespan and minimizing maintenance requirements.

08. Main devices

3. Potential Transformer

In Door Type Voltage Transformer

- Compact and concentrated fuse holder can be easily applied to the VTS compartment.
- Compact and epoxy molded for superior insulation and maintenance free

Onaelectric OX5 GridSafer MV Switchgears

1. SMART PROTECTION SYSTEM:

   The OX5 GridSafer provides advanced protection mechanisms forMV switchgears, enhancing safety against electrical faults andensuring reliable operation.

2. REAL-TIME DATA MONITORING:

   It enables real-time monitoring of switchgear performance, allowingfor immediate detection of anomalies and ensuring optimal operation.

3. REMOTE ACCESS AND CONTROL:

   Operators can remotely access and control the MV switchgears, facilitatingtimely interventions and reducing the need for on-site visits.

4. AUTOMATED FAULT MANAGEMENT:

   The system automates fault detection and isolation, minimizing downtime and improving the reliability of the electrical network.

5. PREDICTIVE MAINTENANCE:

   With data analytics capabilities, OX5 GridSafer can predict potential failures, enabling proactive maintenance schedules and reducing unexpected outages.

6. ENHANCED LOAD MANAGEMENT:

   The system optimizes load distribution, ensuring that MV switchgears operatewithin their capacity limits and enhancing overall efficiency.

7. USER-FRIENDLY INTERFACE:

   It features an intuitive interface that simplifies monitoring and management tasks, making it accessible for operators with varying technical expertise.

8. INTEROPERABILITY:

   OX5 GridSafer is designed to work seamlessly with existing infrastructure and other smart grid devices, ensuring compatibility and flexibility in integration.

9. ENVIRONMENTAL SUSTAINABILITY:

   By optimizing energy usage and reducing losses, the system contributes to a greener energy landscape and supports sustainability goals.

10. IMPROVED SYSTEM RELIABILITY:

    The integration of OX5 GridSafer enhances the reliability of MV switchgears, reducing the frequency of failures and improving the overall performance of the electrical grid.

11. CUSTOMIZABLE SOLUTIONS:

    The system can be tailored to meet specific operational needs, allowing for customized configurations based on the requirements of different installations.

12. ENHANCED SAFETY PROTOCOLS:

    The smart features included in OX5 GridSafer bolster safety protocols, protecting both personnel and equipment from potential hazards.

Ona Electric Industries: 5-Year Warranty Commitment

At Ona Electric Industries, we believe in the quality and durability of our products. That's why we offer a comprehensive 5-Year Warranty on all our electrical solutions, including our switchgear, transformers, smart grids, and more.

Benefits of Choosing Ona Electric:

-Long-Term Reliability: Trust in the longevity of your electrical systems.
-Top-Tier Support: Our dedicated support team is always here to assist.
-No Additional Costs: Enjoy full coverage without hidden fees.

ONA Electric Industries

ONA Electric Industries

New era of digital electricity solutions today

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Powering your future, safely.

ONA Electric Industries