RVAC
Professional solutions, Reliable power

Gas Insulated Ring Main Unit

EATON
Powering Business Worldwide
Eaton delivers the power inside hundreds of products that are answering the demands of today’s fast changing world.

We help our customers worldwide manage the power they need for buildings, aircraft, trucks, cars, machinery and entire businesses. And we do it in a way that consumes fewer resources.

**Next generation transportation**

Eaton is driving the development of new technologies – from hybrid drivetrains and emission control systems to advanced engine components – that reduce fuel consumption and emissions in trucks and cars.

**Higher expectations**

We continue to expand our aerospace solutions and services to meet the needs of new aviation platforms, including the high-flying light jet and very light jet markets.

**Powering Greener Buildings and Businesses**

Eaton’s Electrical Group is a leading provider of power quality, distribution and control solutions that increase energy efficiency and improve power quality, safety and reliability. Our solutions offer a growing portfolio of “green” products and services, such as energy audits and real-time energy consumption monitoring.

Eaton’s Uninterruptible Power Supplies (UPS), variable-speed drives and lighting controls help conserve energy and increase efficiency.

**Building on our strengths**

Our hydraulics business combines localised service and support with an innovative portfolio of fluid power solutions to answer the needs of global infrastructure projects, including locks, canals and dams.
RVAC
Ring Main Unit

The development of current power system focuses on the usage of ecological resources. Low power loss, low maintenance spending, reliable performance, flexible configuration are required on the medium voltage switchgear. Due to its features such as long service life, compact size and recycling, Eaton RVAC ring main units have proved successful in terms of economy and ecology. It appears more important for Underground cabled power distribution network in improving its devices and other aspects, with rapid development of urbanization; ring main units (RMU), as the major device for protection and segment isolation to ground cabled distribution network, are widely used in urban power grids, due to its safe and reliable performance, compact and superior cost effectiveness.

Eaton as the leader in the field of distribution switchgear has Lean to designing and manufacture high-quality power distribution switchgear since 1942, with over 2 million switchgear operating reliably over the world till now.

Based on the design concept of full insulation and fully sealed, all primary parts within RVAC RMU are fully sealed inside the stainless-steel main enclosure, protect to against condensation and external contaminated environment; the protection degree of the main tank body is up to IP67, equipped with Cooper’s water-proofing touchable cable bond, which can provide effective protection against accidental flood in rainy climate.
RVAC Ring Main Unit Construction Feature

Smart grid readiness
Designed to integrate solutions for sensing, monitoring and remote control for feeder automation and load management purposes.

Personal safety
- Logical mechanical and electrical interlocks;
- Complete enclosure earthing, to ensure zero potential for interface;
- Compartments protected against penetration of objects;
- Capacitive voltage detection system for verification of safe isolation from supply;
- Feeder earthing by means of make-proof earthing switch.

Environmental-friendly concept
- Low power loss, low maintenance spending, ensuring more reasonable cost investment;
- Only reusable and/or recyclable materials can be used to do the most compact design;
- In normal working conditions, gas leakage rate of lower than 1‰ ensures more than 30 years life-cycle;
- Without gas work on site through installation, operation, extension, and replacement of the product.

User friendly
- Cable connection and user interfaces for operation on the same front side of the panel;
- Ergonomic cable connection height;
- A customized low voltage compartment is optional;
- Clear and simple straightforward operation panels.

Modular design and flexible configuration
- Both multi-functions in one tank solution and individual panel can be freely combined and extended, to satisfy demands of different customers;
- Non-extensible and both side extensible design suit for your requirements;
- Flexible extension of unit modules on site, easy to build medium voltage transformer substations according to different requirements;
- Two options are available for transformer and line protections: load break switch-fuse combination units and circuit breakers with relay protection.

All-weather and high adaptability to environment
- SF6 gas tank is made of stainless steel plates, with anti-rust painting treatment on the surface, to protect against salt spray, humidity, dirt and temperature, and to ensure durable nice appearance;
- COOPER pre-fabricated shielding touchable cable terminal is supplied, suitable for long-term operation underwater or in other severe conditions.

Operation
- Complete design certified in accordance with GB / DL and IEC standards;
- Arc fault tested according GB3906 / IEC 62271-200;
- Quality assurance in accordance with ISO 9001;
- Touching safe and hermetically sealed primary enclosure;
- Gas tank’s zero gauge voltage withstand (1min) can reach power frequency withstand voltage.
Main Construction

Vacuum technology features

- Eaton has an unsurpassed leadership in vacuum technology supported by a strong heritage of innovation from companies such as Westinghouse and Holec.
- Pioneers in vacuum technology for over 90 years. First vacuum interrupter supplied at 15kV-12kA in 1967.
- Eaton was the first one to develop and patent copper-chromium alloy content for contacts and center shields.
- Our vacuum interrupters for contactor applications can perform up to 2.5 million mechanical operations.
- More than 5 million units delivered worldwide, operating safely and reliably in all types of networks, medium voltage applications and environments.
- High end certified supplier to almost all major electrical manufacturers worldwide.

SF6 gas insulated system

- All primary high-voltage components are completely enclosed in SF6 gas tank, free from environment impact, thus ensuring fully insulation and maintenance-free.
- SF6 gas tank is made of high-quality stainless steel materials, free from influence of salt spray, humidity, dirt and temperature, ensuring a durable nice outlook.
- With IP67 protection degree, can reliably prevent from flood immersion in summer.
- Advance gas shielded welding as well as a sealing pressure system of less than 1‰ leakage rate ensure a 30 year service cycle.
- Non-extensible is standard busbar extensible is optional.

Load break switch

The load break switch is a 3-position switch, with Close, Open and earthing position. When in Open position, the moving blade has sufficient insulation distance. An operating handle can be used to make close-open operations on load break switch and earthing switch. There are mechanical interlocks between the load break switch and the earthing switch.

- The load break switch applies metal deionizing arc suppress technology, ensuring good interruption performance for the switch.
- The working speed of switch’s moving contact depends on its operation mechanism; and the open-close speed of the switch will not be influenced by operators.
- When moving from closing to opening, the load break switch depends on moving contact speed and arc suppress devices simultaneously, to suppress arc and break current.
- The spring operation mechanism with an operating handle to complete closing and opening operations. Motorization module and opening coil can be added, to achieve remote control.
**Product Features**

RVAC is developed to be an economical and ecological user-friendly power distribution device of compact size, reliable performance and flexible configuration, with the application of advanced R&D technical resources.

**Computer simulation design**

3D simulation design analysis softwares are applied during R&D process, strengthening design capacity, and thus improving product reliability greatly.

**Mechanical movement analysis and force analysis**

**Mechanical strength analysis**

**Gas pressure analysis**

**Magnetic field analysis**

**Electric field analysis**

**Gas motion analysis**

**Capacitive voltage detection system for verification of safe isolation from supply**

Each panel type within the RVAC family is equipped with a standard three phase Voltage Detection System for voltage testing. The VDS shows the operator if the panel is isolated from supply or not.

**Logical mechanical and electrical interlocks prevent incorrect operation**

Within the RVAC design misoperation by an operator is prevented by using different interlocks. The interlocks are mechanical and electrical. For example electrical and mechanical interlocks prevent operation of the change-over switch when the circuit-breaker is switched on. All mechanical interlocks are constructed in such a way that they directly block the mechanism.

**Sealed enclosure design, to effectively protect against foreign objects**

In the design of RVAC, it is not possible for external staff or tools to accidentally enter into the panel.

**Smooth contemporary design**

All compartments of the RVAC panels are designed in such a way that the system is safe to touch from the outside. By using a smooth and smart design it is not possible for the operator to injure himself by moving parts or by parts that stick out of the switchgear when moving in front of the switchgear.

**Routine tests**

Various prescribed routine tests are carried out during the production of the switchgear. To assure quality, all processes are in accordance with ISO 9001. This means that at every stage of production the components, circuit-breakers and current transformers are inspected for correct functionality. When the entire installation has been assembled, a thorough visual inspection is carried out, together with mechanical, functional and electrical checks.

**Anti-internal arcing concept**

Eaton has always been focusing on building consistently safe switchgear devices for operators. The biggest potential risk for operators is internal arcing within the switchgear device.

Therefore, design engineers have taken all necessary measures to prevent internal arcing during product design process.

Eaton supports the philosophy that it is best to avoid internal arcs than to cure, in line with the relevant standard GB 3906, IEC 62271. Within the RVAC design a double prevention philosophy is used. Firstly, the design is constructed in such a way that an internal arc is prevented. In the unlikely case that an internal arc could occur, the RVAC is equipped to provide maximum safety to the operator, and to control and minimise damage to the rest of the switchgear and room.

**Only when the cable compartment door is closed, the device can be operated to power-on position**

Only when the switch is operated to Earthing position, the cable compartment door can be opened in a normal way. Only when the cable compartment door is closed completely, a closing operation can be conducted on the earthing switch. After the earthing switch is opened, the mains switch can conduct closing operation to complete power-on process.
Sulfur Hexafluoride (SF6) Gas

The insulating and arc quenching medium -SF6

SF6 gas, previously used mainly in circuit breaker of higher voltage level and with successful achievements, has now been found into medium voltage load switching system in recent years. This change happens to systems all over the world, since each insulation and arc-extinguishing medium, including air, oil and solid material, has its own critical defect more or less:

- Air insulation system occupies a large amount of space, which requires maintenance in extreme climate or environment;
- Oil insulation system will cause huge safety risks due to internal faults, although not influenced by external environment;
- Finally, solid system has the same maintenance issue as air insulated devices do, but with problems to a higher level due to its compact structure.

SF6 is a non-toxic, inert and electronegative gas, heavier than air, offering very effective arc-extinguishing performance, along with the above-mentioned high insulation capability. In the case of high temperature arc produced by circuit breaking, SF6 gas will resolve into subfluorides. After cooling down, these active subfluorides will quickly return back to SF6 gas. Therefore, SF6 gas which is used under sealing for a long time will not decrease or deteriorate, although under the effect of arc extinguishing several times. The amount of arc decomposition depends on water content contained in SF6 gas. In this way, it is very critical to control water content below specified values. Adsorbing agents such as commonly used activated alumina or activated carbon and synthetic zeolite remove water and arcing products, which means the volume of the gas originally introduced keeps unchanged and can satisfy requirements for working life or mechanism of the whole system. An evaluation of advantage and potential risks shows that at present there is no substitutable solution of technical and ecological values.

Final disposal of SF6 gas

1. The policy of Eaton is that SF6 gas shall be inhibited to emit into air during the process of installation, maintenance and scrapping of devices. Environmental solutions can be used to dispose SF6 gas which can't be recycled or reused any more, which produce natural product gypsum (CaSO4) and fluorite (CaF2).


SF6 gas has very high dielectric strength as an insulation medium, thus offering very compact products in the design of structural arrangement, and maintenance free since all live parts are completely sealed.
Features and benefits

The benefit of a sealed for life tank
A “sealed for life” steel enclosure contains all primary parts and driving mechanisms
- Maintenance free
- Internal arc proof
- Protection degree up to IP67 for prevention of summer floods

The benefit of a compact design
- Minimal floor space
- Low building costs
- Easy to install

Computer simulation design
3D simulation design analysis softwares are applied during R&D process to strengthen design capacity, thus improving product reliability greatly.
- Electric field analysis
- Magnetic field analysis
- Gas pressure and motion analysis
- Mechanical strength analysis
- Mechanical movement (speed and force) analysis
- Finite element analysis

Smart grid readiness
Automation upgrading
- Remote close/open
- Auxiliary contacts for each position local or remote indications
- Measuring CT and current signal

Option
- Trip indicator with auxiliary contacts
- Fault indicator
- Current meter

Flexible solutions
- Reliable busbar extended design and interfaces reserved for future project expansion
- Complete types of functional units

Load break switch panel “K”
Load break switch-fuse combination panel “T”
Circuit breaker panel “V” & “CB”
Rise panel “A” & “B”

Busbar coupler “L(k)”
Busbar coupler “L(v)”
Metering panel “M”
Voltage transformer panel “PT”
Configuration information

Load break switch panel (Function K)

<table>
<thead>
<tr>
<th>Standard</th>
<th>Options</th>
</tr>
</thead>
<tbody>
<tr>
<td>630A load break switch</td>
<td>Extension on both sides</td>
</tr>
<tr>
<td>SF6 pressure gauge</td>
<td>Lateral incoming and outgoing</td>
</tr>
<tr>
<td>Voltage presence indicator</td>
<td>Motorization mechanism</td>
</tr>
<tr>
<td>Reliable interlock</td>
<td>Bottom plate</td>
</tr>
<tr>
<td>Operating handle</td>
<td>Cable inspection window</td>
</tr>
<tr>
<td>Cable clamp and bracket</td>
<td>Short circuit fault indicator</td>
</tr>
<tr>
<td>Voltage presence indicator</td>
<td>Earthing switch</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Rated voltage (kV)</th>
<th>W (mm)</th>
<th>D (mm)</th>
<th>H (mm)</th>
<th>Weight (kg)</th>
</tr>
</thead>
<tbody>
<tr>
<td>24</td>
<td>370</td>
<td>870</td>
<td>1400</td>
<td>132</td>
</tr>
</tbody>
</table>

Note: A without gas tank; B with gas tank

Lift panel (Function A/B)

<table>
<thead>
<tr>
<th>Standard</th>
<th>Options</th>
</tr>
</thead>
<tbody>
<tr>
<td>Voltage presence indicator</td>
<td>Extension on both sides</td>
</tr>
<tr>
<td>630A bushing</td>
<td>Lateral incoming and outgoing</td>
</tr>
<tr>
<td>Padlock for cable compartment cover</td>
<td>Cable inspection window</td>
</tr>
<tr>
<td>SF6 pressure gauge</td>
<td>Short circuit fault indicator</td>
</tr>
<tr>
<td>Voltage presence indicator</td>
<td>Current meter</td>
</tr>
<tr>
<td>Operating handle</td>
<td>Bottom plate</td>
</tr>
<tr>
<td>Cable clamp and bracket</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Rated voltage (kV)</th>
<th>W (mm)</th>
<th>D (mm)</th>
<th>H (mm)</th>
<th>Weight (kg)</th>
</tr>
</thead>
<tbody>
<tr>
<td>24</td>
<td>370</td>
<td>870</td>
<td>1400</td>
<td>110</td>
</tr>
</tbody>
</table>
Load break switch-fuse combination panel (Function T)

**Standard**
- 630A load break switch
- Earth switch
- Fuse tube
- SF6 pressure gauge
- Voltage presence indicator
- Reliable interlock
- Operating handle
- Cable clamp and bracket

**Options**
- Extension on both sides
- Lateral incoming and outgoing
- Motorization mechanism
- Electric shunt release
- Bottom plate
- Cable inspection window
- Short circuit fault indicator
- Fuse adapter *

* Adapter must be applied together with 12kV Fuse when the system rated voltage is 12kV.

<table>
<thead>
<tr>
<th>Rated voltage (kV)</th>
<th>W (mm)</th>
<th>D (mm)</th>
<th>H (mm)</th>
<th>Weight (kg)</th>
</tr>
</thead>
<tbody>
<tr>
<td>24</td>
<td>370</td>
<td>870</td>
<td>1400</td>
<td>170</td>
</tr>
</tbody>
</table>

**The fuse dimension**

- The fuse dimension
- The length after fuse blown
- 30max(Spring type)

**Fuse striker:**
Medium type (according IEC 60282-1, DIN and GB 15166.2, alternating current switch-fuse combinations).

**The guide for fuse selection**

<table>
<thead>
<tr>
<th>General type</th>
<th>Rated voltage (kV)</th>
<th>Rated fuse current (A)</th>
<th>Length A (mm)</th>
<th>Diameter D (mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>XRN-T/12</td>
<td>12</td>
<td>3.15 / 6.3 / 7.5 / 10 / 16 / 20 / 25 / 31.5 / 40</td>
<td>292</td>
<td>51</td>
</tr>
<tr>
<td></td>
<td></td>
<td>50 / 63 / 80</td>
<td>292</td>
<td>66</td>
</tr>
<tr>
<td></td>
<td></td>
<td>100 / 125</td>
<td>292</td>
<td>76</td>
</tr>
<tr>
<td>XRT1-24</td>
<td>24</td>
<td>3.15 / 6.3 / 7.5 / 10</td>
<td>442</td>
<td>51</td>
</tr>
<tr>
<td></td>
<td></td>
<td>16 / 20 / 25 / 31.5</td>
<td>442</td>
<td>66</td>
</tr>
<tr>
<td></td>
<td></td>
<td>40 / 50 / 63 / 80</td>
<td>442</td>
<td>76</td>
</tr>
<tr>
<td></td>
<td></td>
<td>100 / 125</td>
<td>442</td>
<td>86</td>
</tr>
</tbody>
</table>

**Fuse selection and transformer application**

**Rated voltage (12kV)**

<table>
<thead>
<tr>
<th>Transformer rated capacity (kVA)</th>
<th>50</th>
<th>100</th>
<th>125</th>
<th>160</th>
<th>200</th>
<th>250</th>
<th>315</th>
<th>400</th>
<th>500</th>
<th>630</th>
<th>800</th>
<th>1000</th>
<th>1250</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fuse rated current (A)</td>
<td>6.3</td>
<td>10</td>
<td>16</td>
<td>16</td>
<td>20</td>
<td>25</td>
<td>32</td>
<td>40</td>
<td>50</td>
<td>63</td>
<td>80</td>
<td>100</td>
<td>125</td>
</tr>
</tbody>
</table>

**Rated voltage (24kV)**

<table>
<thead>
<tr>
<th>Transformer rated capacity (kVA)</th>
<th>≤ 40</th>
<th>100</th>
<th>125</th>
<th>160</th>
<th>200</th>
<th>250</th>
<th>315</th>
<th>400</th>
<th>500</th>
<th>630</th>
<th>800</th>
<th>1000</th>
<th>1250</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fuse rated current (A)</td>
<td>3.15</td>
<td>6.3</td>
<td>10</td>
<td>16</td>
<td>16</td>
<td>20</td>
<td>25</td>
<td>31.5</td>
<td>40</td>
<td>50</td>
<td>63</td>
<td>80</td>
<td>100</td>
</tr>
</tbody>
</table>
Circuit breaker panel (Function V)

**Standard**
- 630A vacuum breaker
- 3-position disconnector
- SF6 pressure gauge
- Voltage presence indicator
- Reliable interlock
- Operating handle
- Cable clamp and bracket

**Options**
- Extension on both sides
- Lateral incoming and outgoing
- Motorization mechanism
- Two cable outgoing lines
- Cable inspection window
- Short circuit fault indicator
- Protection relay

<table>
<thead>
<tr>
<th>Rated voltage (kV)</th>
<th>W (mm)</th>
<th>D (mm)</th>
<th>H (mm)</th>
<th>Weight (kg)</th>
</tr>
</thead>
<tbody>
<tr>
<td>24</td>
<td>520</td>
<td>870</td>
<td>1400</td>
<td>250</td>
</tr>
</tbody>
</table>

Busbar coupling panel (Function L)

**Standard**
- Voltage indicator
- 630A LBS
- 630A load break switch

**Options**
- 630A CB
- Motor operation

**Load-break-switch type L(k):**

<table>
<thead>
<tr>
<th>Rated voltage (kV)</th>
<th>W (mm)</th>
<th>D (mm)</th>
<th>H (mm)</th>
<th>Weight (kg)</th>
</tr>
</thead>
<tbody>
<tr>
<td>24</td>
<td>480</td>
<td>870</td>
<td>1400</td>
<td>150</td>
</tr>
</tbody>
</table>
Busbar coupling panel (Function L)

<table>
<thead>
<tr>
<th>Standard</th>
<th>Options</th>
</tr>
</thead>
<tbody>
<tr>
<td>Voltage indicator</td>
<td>630A CB</td>
</tr>
<tr>
<td>630A LBS</td>
<td>Motor operation</td>
</tr>
<tr>
<td>630A load break switch</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Circuit-breaker type L(V)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rated voltage (kV)</td>
</tr>
<tr>
<td>24</td>
</tr>
</tbody>
</table>

Metering panel (Function M) / Voltage transformer panel (Function PT)

<table>
<thead>
<tr>
<th>Standard</th>
</tr>
</thead>
<tbody>
<tr>
<td>Electromagnetic lock (with live latch)</td>
</tr>
<tr>
<td>PT</td>
</tr>
<tr>
<td>PT protection fuse</td>
</tr>
<tr>
<td>CT</td>
</tr>
<tr>
<td>Meter</td>
</tr>
<tr>
<td>Voltage presence indicator</td>
</tr>
<tr>
<td>Voltage meter</td>
</tr>
<tr>
<td>Current meter</td>
</tr>
<tr>
<td>Transfer switch</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Options</th>
</tr>
</thead>
<tbody>
<tr>
<td>Energy meter</td>
</tr>
<tr>
<td>Voltage loss meter</td>
</tr>
<tr>
<td>Temperature and humidity controller</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Function M</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rated voltage (kV)</td>
</tr>
<tr>
<td>24</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Function PT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rated voltage (kV)</td>
</tr>
<tr>
<td>24</td>
</tr>
</tbody>
</table>
PBD protection relay

- 3-phase 3-step directional current protection (quick break, timed quick break, over-current inverse time), with low voltage locking function
- 3-phase 3-time reclosing (inspection for no voltage, inspection for synchronization, no inspection), the number of reclosing operations can be set, including the function of post-acceleration
- Zero sequence voltage locking direction zero sequence over current protection (alarm, optional tripping operation)
- Low current grounding line selection function
- Low voltage protection
- Overload alarm
- 24V DC

PSW Self-powered protection device

The PSW Self-powered protection device is a kind of protection device for 10 kV feeder lines which has over current, instantaneous trip and ground protection functions. This product can be used in conjunction with the ONT-W series current transformers (CT), and the power is supplied from line current through CT, so over current, instantaneous trip and ground protection for distribution network lines could be achieved without auxiliary power supplies by driving low power trip coils.

PSW 100 Function:
- Definite time over current protection (ANSI 50/51)
- Definite time instantaneous trip protection (ANSI 50/51)
- Inverse time over current protection (ANSI 50/51)
- Definite time single phase to ground protection (ANSI 50N/51N)
Main Components

Voltage indicator
A device on all functional units makes it possible to check the presence (or absence) of voltage in the cables. With the holes for phase comparators.

Fault indicator
The indicator is used for detecting and indicating ground fault and short-circuit fault in corresponding cable sections. The indicator light flashes with alarm when short-circuit fault or single-phase ground fault occurs in the power distribution system.

Cooper Screened Separable Connectors
For connection of extruded polymeric cable to transformers, switchgear, motors and other equipment with premolded screened separable connectors for XLPE insulated 1 or 3-core cabled with aluminum or copper conductors.

Connection mode

Extension interface
For future extension connected to another module RVAC.

Busbar Linker
Connected existing module RVAC with another module RVAC.

Busbar ender stop
When the cabinet is reserved for future expansion on Extension interface, and the busbar linker is not installed, you need to use Busbar ender stop to protect the main busbar bushing.

Insulation cap
When the cabinet is reserved busbar bushing for transformer on the main busbar side, and the cable plug is not installed, you need to use Insulation cap to protect the busbar bushing.

Fuse adapter
The adapter must be configured together with fuse when the product is used in 12kV system.
### RVAC Technical Data

<table>
<thead>
<tr>
<th>Item</th>
<th>Ratings</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>General</strong></td>
<td></td>
</tr>
<tr>
<td>Rated voltage kV</td>
<td>24</td>
</tr>
<tr>
<td>Power frequency withstand voltage (1min)</td>
<td></td>
</tr>
<tr>
<td>Phase to phase/Phase to earth kV</td>
<td>50</td>
</tr>
<tr>
<td>Between isolating distance</td>
<td>60</td>
</tr>
<tr>
<td>Lightning impulse withstand voltage (BIL)</td>
<td></td>
</tr>
<tr>
<td>Phase to phase/Phase to earth kV</td>
<td>125</td>
</tr>
<tr>
<td>Between isolating distance</td>
<td>145</td>
</tr>
<tr>
<td>Rated frequency Hz</td>
<td>50</td>
</tr>
<tr>
<td>Internal arc classification (IAC)</td>
<td>kA-s AFLR 20-1</td>
</tr>
<tr>
<td>Degree of protection in service</td>
<td>IP3X</td>
</tr>
<tr>
<td>Degree of protection with doors/cover open</td>
<td>IP2X</td>
</tr>
<tr>
<td><strong>Busbar system</strong></td>
<td></td>
</tr>
<tr>
<td>Rated normal current A</td>
<td>630</td>
</tr>
<tr>
<td>Rated short-time withstand current kA-s</td>
<td>20-3</td>
</tr>
<tr>
<td>Rated peak withstand current kA</td>
<td>50</td>
</tr>
<tr>
<td><strong>Load break switches panel</strong></td>
<td></td>
</tr>
<tr>
<td>Rated normal current A</td>
<td>630</td>
</tr>
<tr>
<td>Rated short-circuit making current kA</td>
<td>50</td>
</tr>
<tr>
<td>Rated short-time withstand current kA-s</td>
<td>20-3</td>
</tr>
<tr>
<td>Mechanical endurance class (Load break switch)</td>
<td>M1 5000</td>
</tr>
<tr>
<td>Mechanical endurance class (Earthing switch)</td>
<td>M1 2000</td>
</tr>
<tr>
<td>Electrical endurance class (active load breaking capacity 630A)</td>
<td>E3</td>
</tr>
<tr>
<td><strong>Circuit-breakers panel</strong></td>
<td></td>
</tr>
<tr>
<td>Rated normal current A</td>
<td>630</td>
</tr>
<tr>
<td>Rated breaking current kA</td>
<td>20</td>
</tr>
<tr>
<td>Rated short-circuit making current kA</td>
<td>50</td>
</tr>
<tr>
<td>Rated capacitive switching current class</td>
<td>C2</td>
</tr>
<tr>
<td>Mechanical endurance class (Circuit-breakers)</td>
<td>M1 2000</td>
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<tr>
<td>Mechanical endurance class (Earthing switch)</td>
<td>M1 2000</td>
</tr>
<tr>
<td>Electrical endurance class</td>
<td>E2</td>
</tr>
<tr>
<td>Rated short-time withstand current kA-s</td>
<td>20-3</td>
</tr>
<tr>
<td>Mechanism type</td>
<td>O - 0.3s - CD - 180s - CD</td>
</tr>
<tr>
<td><strong>Switch-fuse combination panel</strong></td>
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</tr>
<tr>
<td>Normal current of load-break switch A</td>
<td>630</td>
</tr>
<tr>
<td>Normal current with fuses A</td>
<td>125</td>
</tr>
<tr>
<td>Rated breaking current kA</td>
<td>31.5</td>
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<tr>
<td>Rated short-circuit making current kA</td>
<td>80</td>
</tr>
<tr>
<td>Rated transfer current A</td>
<td>900</td>
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</tbody>
</table>

For others, please contact local Eaton sales representative.

### RVAC designed to IEC standards

RVAC complies with the following standards:

- IEC62271-1:  Common specifications for high-voltage switchgear and controlgear
- IEC62271-103: High-voltage switches for rated voltages above 1kV up to and including 52 kV
- IEC62271-102: High-voltage alternating current disconnectors and earthing switches
- IEC62271-200: A.C. metal-enclosed switchgear and controlgear for rated voltages above 1kV and up to including 52kV
- IEC62271-100: High-voltage alternating-current circuit breakers
- IEC62271-105: High-voltage alternating current switch-fuse combinations for rated voltage above 1kV up to and including 52kV
RVAC Outlines and Dimensions

Type K panel dimension

Type T panel dimension

Type V panel dimension

Type M panel dimension
Basic Installation Diagram

<table>
<thead>
<tr>
<th></th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th>E</th>
<th>F</th>
<th>G</th>
<th>H</th>
<th>I</th>
</tr>
</thead>
<tbody>
<tr>
<td>Size (mm)</td>
<td>800</td>
<td>730</td>
<td>683.5</td>
<td>800</td>
<td>750</td>
<td>520</td>
<td>470</td>
<td>82</td>
<td>8</td>
</tr>
</tbody>
</table>

A (Chassis) B (8# steel channel)

This row of mounting holes is available as an option.

The front of the switchgear
Recommended Floor Plan

The front of the switchgear

Size (mm)

I

II

Chassis

M8 x 30

(8# steel channel)

23.5

I

II

Chassis

M8 x 30

(8# steel channel)
Features for substation

Switching substation combined with indoor SF6 gas insulated RMU RVAC and outdoor enclosure.

- The enclosure material uses stainless steel or Zn-Al steel sheet with painting, the steel thickness is not less than 2mm, has the strong corrosion resistance; The loose parts are all metal sheet parts and are welded/riveted/bolted with each other to ensure the stable structure and light weight and elegant appearance.

- The top cover is a water-proof clival structure with ventilation outlet. The ventilation inlet is arranged in the lateral of enclosure with removable dust-proof filter net and the outlet is arranged at the top of the enclosure hidden under the eaves. It makes air convection from bottom to top.

- The cable inlets with sealed bottom plates are locked the bottom of outdoor enclosure to prevent moisture from cable channel into case body.

- The doors and lugs are sealed with sealing strips, the locks for doors is rainproof. The limiting hook is installed on the door to make door fix when the door is opened for maintenance.

- RMU inside enclosure is maintenance free design, which can adapt to the harsh outdoor environment.

- With the automatic terminal module(RTU) and remote control/ Monitoring Unit to facilitate the implementation of more extended functions.

- The outdoor enclosure’s dimension and color will defined by project, the specific request may contact EATON beforehand.

- Key performance of outdoor switching sub-station:
  - Protection class: IP44 (IP54 optional)
  - Mechanical impact class: IK08
  - IAC: AFLR 20KA 1s
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