VERTIV.

Vertiv™ PowerBoard Medium-Voltage Switchgear

Protecting Power Infrastructure at Data Centers, Industrial Companies, and Utilities

Vertiv™ PowerBoard Medium Voltage Switchgear

Thanks to fast-paced digital growth, the demand for electricity shows no signs of abating. Global demand for electricity is expected to increase at a rate of 2.1 percent a year to 2040[1]. That means organizations everywhere will be deploying new medium-voltage switchgear at data centers, utility power generation and transmission facilities, and commercial and industrial facilities.

Another driver of switchgear sales is the need to upgrade aging utility infrastructures. In the United States, the average age of electrical transmission infrastructure is 40 years old[2], while European distribution grids still need between €375 billion and €425 billion this decade to modernize infrastructures and connect networks to renewable energy sources[3]. Other businesses as well will want to use medium-voltage switchgear to boost renewable energy use and return power to the grid.

However, this red-hot market demand is meeting some significant real-world constraints. Raw material shortages, production slowdowns, and logistics issues are resulting in project delays, including the delayed opening of new data centers. As a result, many leaders are seeking to find highly reliable partners who can provide faster deliveries of new switchgear products.

Vertiv can help. We offer an indoor medium-voltage (MV) switchgear line, ranging from 1kV to 40.5kV, for the US and EMEA markets. Vertiv™ PowerBoard MV switchgear is entirely manufactured in-house and is available in air-insulated and gas-insulated options, as well as metal-clad and metal-enclosed options. By controlling key processes, we provide our customers with speed-to-market, customizability, and competitive costs.

Benefits

- **Receive consultative support:** Our team of engineers can help you select the right switchgear for your application, voltage and current requirements, space constraints, heightened safety, and other requirements. As a result, you'll be able to value-engineer your solution for optimal results.
- **Sole-source your certified switchgear:** Vertiv offers medium-voltage (MV) switchgear at multiple voltage levels and current and fault ratings. Our products meet the International Electrotechnical Commission (IEC) 62271 standard for Vertiv European applications and MV Switchgear 15kV meets the Underwriters Laboratories (UL) standard C37.20.2/3 for the North American market.
- **Increase accountability with a single point of contact:** Customers will typically just work with one engineer, who will guide them from requirements gathering through design, fabrication, and logistics. There's no need to contact or coordinate other subcontractors, such as busbar manufacturers or metalworking firms.
- **Gain fast, cost-effective customization capabilities:** Vertiv can quickly incorporate your design feedback in-house, keeping projects on schedule for rapid completion. You benefit with faster deliveries of competitively priced, high-quality products.
- **Choose your own components:** Some manufacturers require that customers purchase specific vendors for breakers and power relays. Vertiv is supplier-agnostic, meaning that you can choose the solutions you want.

[1] Globe Newswire

[2] Marsh McLellan

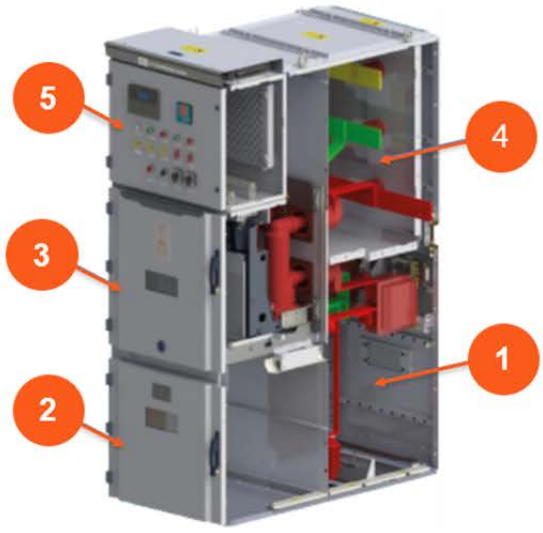
[3] SPGlobal

Vertiv™ Air-Insulated Switchgear

Vertiv™ air-insulated switchgear features a repeatable standard design that's easy to customize. Customers can also opt to install withdrawable vacuum circuit breakers for easy maintenance.

This solution requires front and rear access and at larger voltage levels can have a larger footprint. It is also more affected by environmental issues than gas-insulated switchgear and thus requires a controlled indoor operating environment, free from humidity and pollution.

Voltage Level	Rated Current	Rated fault level
12kV	630A, 1250A & 2000A	31.5kA
12kV	1250A & 2000A	40kA
17.5kV	630A, 1250A & 2000A	31.5kA
17.5kV	1250A & 2000A	40kA
24kV	630A	25kA
24kV	1250A & 2000A	31.5kA
40.5kV	630A, 1250A & 2000A	31.5kA



Vertiv™ Air Insultated Switchgear (AIS)

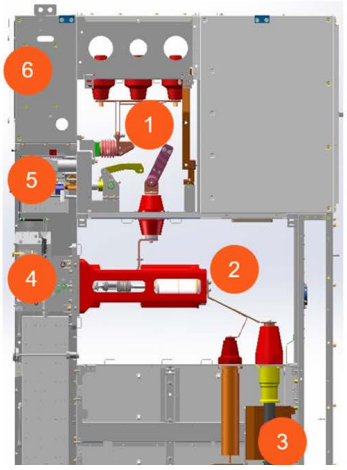
1. Cable Compartment
2. Voltage Transformer Compartment
3. Vacuum Circuit Breaker Compartment
4. Main Busbar Compartment
5. LV Control Section

Vertiv™ Gas-Insulated Switchgear

Vertiv™ gas-insulated switchgear occupies a smaller footprint than air-insulated switchgear with equivalent voltages and ampacity. It also provides stronger environmental performance, as the primary components are sealed in a pressurized gas tank.

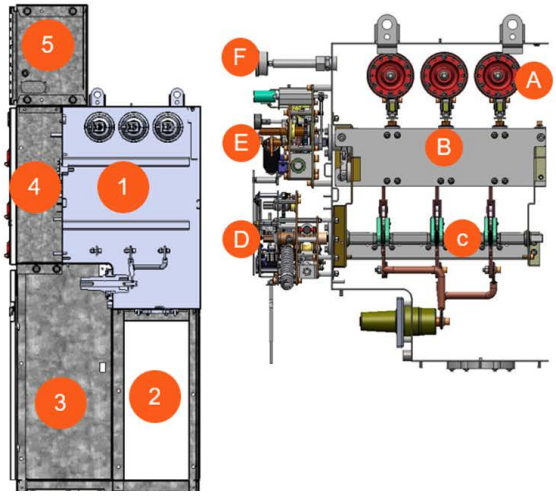
However, this type of switchgear uses sulfur hexafluoride, a greenhouse gas. As a result, these units require special end-of-life handling procedures to safely decommission them.

Voltage Level	Rated Current	Rated fault level
12kV	630A (Secondary switchgear)	20kA
24kV	630A (Secondary Switchgear)	20kA
40.5KV	630A (Secondary Switchgear)	20kA
24kV	630A, 1250A, 2000A & 2500A	31.5kA
40.5kV	630A, 1250A, 2000A & 2500A	31.5kA



Vertiv™ Gas Insultated Switchgear (GIS) - Primary

1. Gas tank to house 3 position switch
2. Gas tank to house Vacuum interrupters
3. Cable connection
4. Vacuum Circuit breaker operating mechanism
5. 3 position switch operating mechanism
6. LV control section



Vertiv™ Gas Insultated Switchgear (GIS) - Secondary

1. Gas tank
   - A. Main Busbar connection
   - B. Vacuum interrupters
   - C. 3 position switch
   - D. 3 position switch operating mechanism
   - E. Vacuum Circuit breaker operating mechanism
2. Void space with access to the gas tank
3. Cable connection
4. Operating mechanism's
5. LV control section

Vertiv™ Metal-Clad Switchgear

Vertiv™ metal-clad switchgear is designed to meet IEC Standard 62271 & C37.20.2/3. It is higher-end switchgear that provides enhanced safety protections. The solution uses metal barriers to separate cable, vacuum circuit breaker, busbar, and low-voltage control compartments from each other.

Voltage Level	Rated Current	Rated fault level
15kV (Single Stack)	600A, 1200A & 2000A	31.5kA
15kV (Double Stack)	1200A, 2000A	40kA

Vertiv™ Metal-Enclosed Switchgear

Vertiv™ metal-enclosed is typically used in secondary applications downstream from primary switchgear. It has an open blade-type load break switch that operates in a common, rather than segmented, section. The switch can operate under load but is not rated to open during a fault condition. However, the solution can be fitted with fuses to provide this capability.

Voltage Level	Rated Current	Rated fault level
15kV (Loop Switch)	600A	25kA

Technical Specifications

- Compact and modular design for air-insulated and gas-insulated solutions
- IP4X, NEMA 1-rated for indoor applications
- Customization capabilities to meet specific requirements
- Offer both front and rear access
- Circuit breakers can be removed for proactive maintenance or safety reasons
- Mechanical and electrical interlocks increase safety and prevent maloperation
- All Vertiv™ switchgear is arc-proof, with the exception of the double-stack solution
- Ability to choose circuit breakers from major manufacturers, such as ABB, Schneider, and Siemens
- Ability to choose protection relays from all major suppliers, such as ABB, Schneider, Fanox, Siemens & SEL.
- Solutions are manufactured in the US, UK, and the Middle East
- Vertiv Switchgear is IEC and EEE-certified

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SL-70974 (R10/22)