



Gas-insulated medium-voltage switchgear

for utilities

Answers for energy.

SIEMENS



8DH10 switchgear
up to 24 kV, up to 20 kA, up to 1,250 A
up to 17.5 kV, up to 25 kA, up to 1,250 A

Full power even under extreme conditions

In the distribution network of utilities a big part of the network topology is made up by substations on the primary and secondary distribution level. The renovation and expansion of this network represents a major investment for the utilities. At the same time, operating costs and costs for power supply breakdowns also have a decisive impact on the cost structure. Minimum maintenance requirements and low hazard potential in case of breakdowns can minimize risks to persons and the plant.

Besides ensuring a maximum level of personal and operational safety, an urgent objective of network operators is lowering operating costs and the likelihood of an outage to the absolute minimum. This is the only way to efficiently deploy the invested capital in every respect, as network failures do not only lead to financial damage, but also have a detrimental effect on the reputation of the power supplier.



NXPLUS C switchgear
up to 24 kV, up to 25 kA, up to 2,500 A
up to 15 kV, up to 31.5 kA, up to 2,500 A



8DA10 switchgear
up to 40.5 kV, up to 40 kA, up to 5,000 A



NXPLUS switchgear
up to 40.5 kV, up to 31.5 kA,
up to 2,500 A

Superior technology for demanding tasks

Highly available, maintenance-free, compact, robust: Gas-insulated medium-voltage switchgear from Siemens provides a convincing solution, even under the most extreme conditions. A worldwide unique, hermetically welded pressure system in a stainless-steel vessel, vacuum switching technology, and a digital protection system make it independent from environmental conditions, and provide maintenance-free operation for life. On top of that, the SF₆ insulation enables an extremely compact construction.

The result: minimum operating costs, maximum performance, and highest safety in every respect.

Reliability

- Type and routine tests in accordance with IEC 62271-200
- Standardized, NC production processes
- Experience from more than 100,000 installed panels
- Quality assurance in accordance with DIN EN ISO 9001

Operational safety

- Hermetically welded switchgear vessels
- Permanently maintenance-free operating mechanisms
- Optimum accessibility of current and voltage transformers
- Complete logical mechanical interlocks
- Minimum fire load

Personal safety

- Safe-to-touch and hermetically welded primary enclosure
- Design tested for resistance to internal faults, metallic partitions, logical mechanical interlocks and capacitive voltage detecting system
- IP65 degree of protection for the primary part



Safe for personnel

The challenge: safe actuation – at all times, in all places

Safe operation of distribution switchgear is of the utmost importance. Operators are exposed to two main risks: direct contact with the primary circuit and internal arcs during maintenance. Therefore, the protection of personnel from the impact of internal faults in the switchgear and its components is vital.

The Siemens solution: state-of-the-art, gas-insulated switching technology

Maintenance-free gas-insulated medium-voltage switchgear from Siemens, corresponding to IP65 degree of protection for all electrical primary components, is hermetically enclosed and safe-to-touch. This means that internal faults caused by environmental influences such as dust and humidity or by maintenance are virtually impossible. In comparison with air-insulated switchgear, personal safety is therefore considerably higher. Nevertheless, arcs must be safely controlled throughout the system. Siemens switchgear is tested on internal faults in accordance with IEC, and offers the highest degree of safety for operators through pressure relief into the cable duct or pressure relief upwards with pressure absorber systems. Maloperation is also prevented by mechanical and electrical interlocks on fuses and cable connections, whereas capacitive voltage detecting systems, metal-enclosed voltage transformers, and make-proof earthing switches increase the active safety of the switchgear.

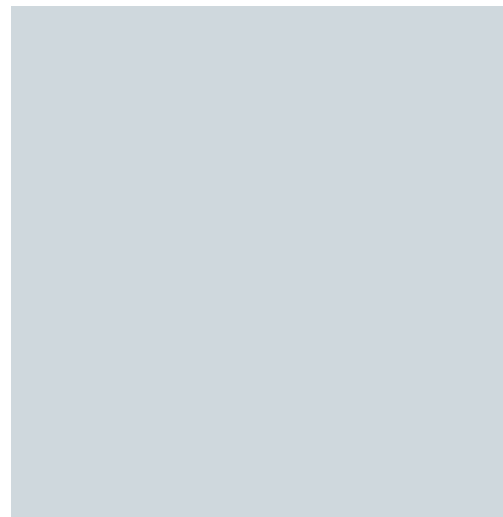
Safe for operation

The challenge: safe operation – at all times, in all places

Arcing faults and their effects are the hardest, costliest, and most dangerous failures in switchgear equipment. Therefore, it is essential that the probability of arcing and its consequences is kept to a minimum, in order to avoid financial damage and to maintain maximum network safety.

The Siemens solution: state-of-the-art, gas-insulated switching technology

Thanks to gas-insulated switchgear (GIS) technology from Siemens, the probability of internal faults is dramatically reduced. As our GIS products are totally maintenance-free, the possibility of faults incurred during maintenance is reduced to zero. In the highly unlikely case of an internal fault, gas-insulated switchgear from Siemens optimally limits the damage, thus reducing repair and replacement costs. An additional advantage of Siemens' GIS technology is that there is no need for block-type current transformers inside the high-voltage part of the switchgear. This reduces the number of components in the high-voltage part, which minimizes potential sources of failure.



Reliable

The challenge: maximum performance around the clock

The permanent supply of electric power to all consumers requires maximum reliability and availability of all system components. Outages are costly, they damage a company's reputation, and should therefore be avoided by all means. At the same time, the switchgear must grant the longest possible lifespan, in order to increase productivity and the utility's profitability.

The Siemens solution: extremely reliable technology

With every gas-insulated medium-voltage switchgear from Siemens you benefit from 25 years of experience and a degree of expertise only the market leader can provide. The probability of an outage is reduced to the absolute minimum, which means maximum reliability and availability.

Robust

The challenge: reliable operation despite extreme environmental conditions

Consumers expect to be supplied with energy at all times, in all places, including regions with exceptionally harsh climatic conditions, for example in the tropics, in a permafrost climate, at high altitudes, or in extremely saline air. Medium-voltage switchgear for power suppliers must withstand such permanent stress for a long time and without difficulty.

The Siemens solution: consistent exclusion of damaging environmental influences

Reliable protection of the high-voltage part of our gas-insulated medium-voltage switchgear is provided by a hermetically sealed primary enclosure and by insulation consisting of inert sulfur hexafluoride. This makes the switchgear resistant to environmental effects such as humidity, saline air, and dust, but also prevents ingress of small animals. Live parts of the primary circuit – busbar, three-position switch, vacuum circuit-breaker, connecting bars, bushings and cable connection – fulfill the IP65 degree of protection.

Efficient

The challenge: maximum availability, minimum operating costs

Switching during maintenance is a potential source of failure and disturbs network operation or the supply process. Each maintenance activity costs money. That's why maximum availability and a minimum need for maintenance are decisive quality criteria for medium-voltage switchgear used for power supply applications.

The Siemens solution: highest reliability and availability

Medium-voltage switchgear from Siemens features a sealed pressure system, which makes the equipment maintenance-free, even under the toughest possible operating conditions. This allows for reduced operating costs and a higher return on investment. Another major advantage of gas-insulated medium-voltage switchgear is that there is no need for heaters in the switchgear panels to counter the condensation of humidity.



Compact

The challenge: individual adjustment to all space requirements

Congested industrial and urban areas are characterized by lack of space, and land is very costly. Increasing or changing energy consumption in city areas often requires additional switchgear panels. However, it is often impossible to expand existing distribution substations. Therefore it is essential to use the available space as efficiently as possible, and to adjust flexibly to given conditions. Space-saving installations call for a compact construction and minimum dimensions, without compromising on the safety of the switchgear.

The Siemens solution: modular and compact construction

Medium-voltage switchgear from Siemens provides the ideal solution for installations in confined spaces. Thanks to its modular design and small dimensions, our switchgear can be flexibly adapted to situations where space is limited.

Environmentally compatible

The challenge: minimum environmental impact throughout the entire life cycle

For consumers it is increasingly important that products are environmentally friendly. This also applies to power supply. High efficiency and emission-free operation, as well as the best option for recycling the equipment at the end of its lifespan are decisive factors that influence a consumer's decision.

The Siemens solution: intelligent technology and sustainable concepts

Medium-voltage switchgear from Siemens with its sealed pressure system does not release any insulating gas into the atmosphere, even under the toughest possible operating conditions. Its compact construction and short conducting paths minimize electric heat losses, thus providing maximum power efficiency. Above that, Siemens is committed to environmental protection. That is why all synthetic materials are clearly labeled for recycling at the end of their service life, and a comprehensive recycling concept makes possible the recovery of the materials and substances used.

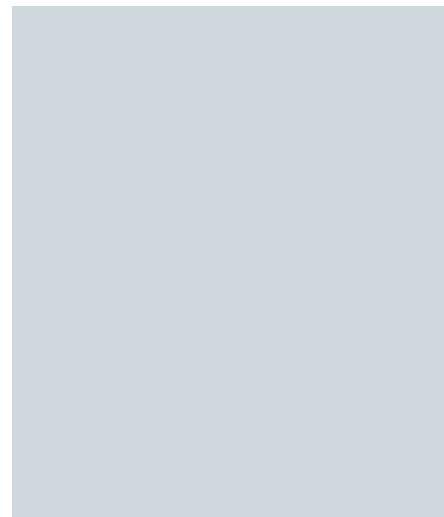
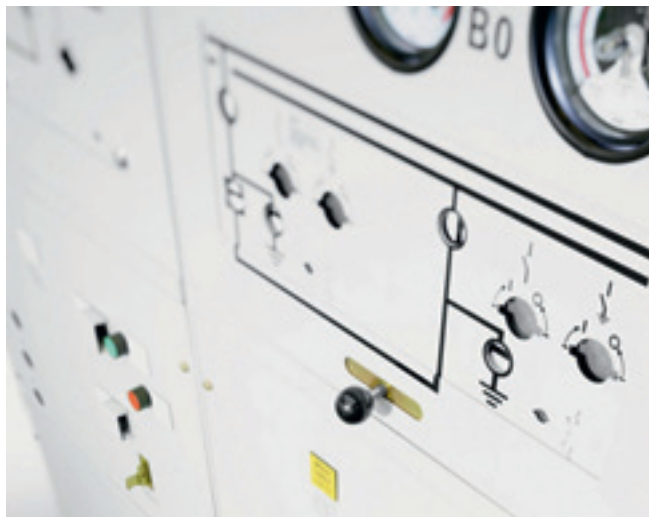
Integratable

The challenge: perfect integration in control and automation systems

Medium-voltage switchgear units are decisive network nodes and must meet the highest safety requirements in every respect, both for processes and personnel. Therefore, they must be fully integratable in the control and automation environment of the complete system. The generator sets, for example, are started up or shut down by a power management system (PMS), which allows for load control of important and unimportant consumers. Seamless interaction between the switchgear and the PMS is therefore indispensable.

The Siemens solution: remote control and central monitoring

Siemens medium-voltage switchgear can be fully controlled from remote – from the control room as well as by the power management system. In connection with the combined protection and control devices, the switchgear panels can be integrated into power management systems and process control systems from different manufacturers.



Durable

The challenge: particularly high switching rates

Lifecycle costs are a decisive factor for the economic evaluation of the switchgear. A particularly high number of operating cycles is a real advantage, as it offers uninterrupted, more efficient, and more economical operation for a long time.

The Siemens solution: vacuum switching technology

Circuit-breakers and contactors from Siemens are exclusively equipped with vacuum interrupters. These extremely durable devices allow for up to 500,000 failure-free making and breaking operations. The operating mechanisms of the switching devices are located outside the high-voltage part. They are accessible from outside without reaching into the enclosure, and they can be inspected without interfering with operation.

Highly performant

The challenge: safe control of high currents

For the consumer, medium-voltage switchgear is of the utmost importance, as it ensures a reliable supply of electrical energy: The switchgear units are the decisive nodal points for power distribution. This means that the switchgear must be able to successfully meet the highest requirements, and to distribute the necessary energy reliably at all times and under all circumstances.

The Siemens solution: a wide product range

Siemens offers a comprehensive range of gas-insulated medium-voltage switchgear. Whatever the requirements, there is always a suitable type of Siemens switchgear to meet them.

- **8DH10**
up to 17.5 kV, up to 25 kA, up to 1,250 A
up to 24 kV, up to 20 kA, up to 1,250 A
- **NXPLUS C**
up to 15 kV, up to 31.5 kA, up to 2,500 A
up to 24 kV, up to 25 kA, up to 2,500 A
- **8DA10**
up to 40.5 kV, up to 40 kA, up to 5,000 A
- **NXPLUS**
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