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High-Voltage Products and Services

From 69kV to 800kV

Answers for infrastructure and cities

Product support for new and legacy equipment, retrofit solutions and replacement circuit breakers for most OEM brands.

As the supplier of OEM parts for your Allis-Chalmers and Siemens medium-voltage switchgear and breakers, Siemens is committed to supporting you with qualified parts and factory trained field service support throughout your products' life cycle.

With Siemens Energy Management Customer Services, an experienced, factory trained engineer who specializes in High Voltage SF6 breaker installations will be on site to provide technical assistance each step of the way.

Turnkey installation services can include replacement and disposal of an existing oil circuit breaker. Thousands of oil circuit breakers (OCBs) made by a variety of OEMs are nearing the end of their useful life. In addition to the high cost and difficulties of finding placement parts, environmental concerns have encouraged customers to replace these breakers with new Siemens SF6 breakers (SPS2, CPV2, and 3AT2).

Supporting

- Turnkey breaker installation/OCB changeouts
- Life-extension and uprate solutions
- Technical field assistance
- Turnkey maintenance and repair
- Testing services
- Current transformers (CTs)
- Replacement parts
- Replacement circuit breakers
- Replacement contactors
- Ground and test devices
- Training onsite or at our factory

Support Capabilities

Gas Insulated Circuit Breakers

Brand/Type	Model	Operator	Spare Parts	Uprate Available	Refurbished Equipment	Field Service	Training
Siemens	SPS2	FA2-FA5	✔	✔	✔	✔	✔
	SPS	SE4	✔	✔	✔	✔	✔
	SPS1	SE4	✔	✔	✔	✔	✔
	3AT	PH30	✔		Limited	✔	
	LPO	PH30	✔			✔	
Westinghouse	SP	SA7	✔			✔	
Merlin Gerin			Limited			✔	

Oil Breakers

Brand/Type	Model	Operator	Spare parts	Uprate Available	Refurbished Equipment	Field Service	Training
Allis-Chalmers	BZO	PH33E-5, PH33T-5, PH33T-6	✔		✔	✔	
	FZO		✔			✔	
	SDO	SE-3B/SE-3C	✔			✔	

Field Service

Choosing Siemens as your service partner is easy. You have a team of highly trained technicians and engineers, backed by the latest technology ad the resources of a global leader. Our technicians are committed to your success. They know your equipment and are focused on solving your most common and difficult challenges. What can be better than that?

Services include:

- Power transformer services
- Power circuit breaker services
- Medium-voltage switchgear services
- High-voltage systems services
- Protection and control services
- Engineering and project management
- Project planning and logistics
- Installation and commissioning services
- Preventative maintenance services
- On-call maintenance agreements
- Emergency services
- Technical field assistance
- Uprates, upgrades and life-extension solutions
- After-market parts
- T&D equipment training
- Load-tap changer services of all manufacturers and types

Training

Onsite training

Siemens can provide an experienced field engineer to bring technical, hands-on training in the environment that you are comfortable in. In this setting, maintenance technicians and asset owners can interact directly with the equipment as the instructor walks through maintenance and repair techniques. When required, we can provide additional learning materials and incorporate classroom instruction as part of the training.

Technical Field Assistance

When field service arises, either planned or unplanned, you can contract Siemens to provide a factory trained engineer to come onsite and assist your chosen contractors or maintenance crews with OEM experience to help you perform your work.

Factory Training

You will be hosted at one of our factories where subject matter experts are located, along with relevant equipment demos. Curriculum is designed to increase the knowledge of personnel responsible for handling, installing and maintaining the equipment. The program consists of classroom training and hands-on instruction.

LifeGuard™ High-voltage Circuit Breaker

30-year extended warranty program

An extended warranty program that brings peace of mind and enhanced financial returns to your business.

The Siemens LifeGuard™ high-voltage circuit breaker 30-year extended warranty program is a warranty extension and long-term maintenance program combined into a single offering. This offering may allow asset owners to capitalize the majority of the costs of ownership over a thirty-year period, assuming the circuit breaker expense may be included as part of a utility's rate base. By being incorporated into the rate base rather than treated as a normal ownership expense, a utility is afforded the opportunity to obtain a rate of return on both the circuit breaker itself as well as the capitalized cost of ownership including maintenance. Depending upon the financial structure of a utility, the increase in rate of return on a typical high-voltage circuit breaker can be between 20 to 40 percent.

In addition to potential enhanced financial returns, Siemens performs all preventative and corrective maintenance associated with the life of the circuit breaker. Incorporated into the cost of the program is remote monitoring of the circuit breaker, which allows Siemens technicians to blend both time- and condition-based maintenance to assure circuit breaker serviceability. Annual reports are provided to the asset owner presenting circuit breaker performance parameters measured during the circuit breaker's operation, as well as test results after major maintenance service is performed.

LifeGuard™ high-voltage circuit breaker extended warranty program can be easily added to cuircuit breakers purchased under a long-term purchase agreement, with circuit breakers automatically enrolled and covered by the program once commissioned into operation.

The basic extended warranty program covers all typical high-voltage circuit breaker applications, such as transmission and transformer protection, with special circuit breaker applications, such as cap bank or reactor switching, being available after technical review of operational and load characteristsics. The program covers all SPS2 circuit breaker ratings and associated mechanisms.

Benefits of the program:

- Preventative and corrective maintenance costs fixed for 30-year term of coverage
- Capitalization of the program's costs allow enhanced rate of return on asset ownership
- Future corrective maintenance cost risk is eliminated for the period of coverage
- Siemens maintains inventory of parts to support maintenance programs
- On-going reports of circuit breaker performance and maintenance performed provided annually
- Can be added to high-voltage circuit breaker long-term purchasing agreements
- High-voltage circuit breakers can be relocated and still covered under the program

In addition to providing factory-trained personnel to perform maintenance and the use of genuine Siemens parts, the data captured from the circuit breaker remote monitoring system provides additional insight into circuit breaker life-cycle management. Data and its related analysis can be prodvided by Siemens to better plan asset capital investment.

Term: Up to 30 years from installation

Coverage: Preventative and corrective maintenance

Product: Available for all Siemens SPS2 72 to 550kV live and dead tank high-voltage circuit breakers.

Maintenance and Upgrades

Model	Maintenance Intervals		Uprates Available	Upgrades Available
	Operations	Per Year		
TCP	3000	12	• Interrupting rating Many 121 145 kV TCP breakers were originally designed for 40 kA. Siemens can increase this rating to 50 kA by adding line to ground capacitors.	• Pressure relief valve Prevent leakage by replacing "dart" type relief valve with direct acting "ball" type • Power unit modification Replace out-of-production Barnes pump with modern design • Dual trip coils Additional trip coils provide redundancy • Current transformer (CT) covers Prevent corrosion by replacing original steel plate with aluminum • -40°F temperature operation Improve operating temperature to -40°F by adding tank heaters • Seismic rating Upgrade breaker to meet seismic zone 3 or 4 • SF_6 manifold Upgrade SF_6 manifold with sampling valve
SP/SPS	2000	8	• Interrupting rating Many SP breakers were originally designed for 23 kA. Siemens can increase this rating to 31.5 kA by replacing the interrupter and adding a tank liner. Siemens can further increase this rating to 40 kA by adding line to ground capacitors. • Continuous circuit Many SP breakers were originally designed for 1,200 amperes. Siemens can increase this rating to 2,000 or 3,000 amperes by changing a bushing component and possibly the current transformers. • Voltage rating It is possible to increase the voltage rating to 72 kV by adding voltage shields.	• SF_6 pressure monitoring Several methods were applied to monitor gas pressure. The later design incorporated a temperature compensated pressure switch in conjunction with a lockout relay that prevents the breaker from operating while the pressure is below safe operating levels. Breakers with other methods can be upgraded to this functionality • Control cabinet anti-condensation Prevent corrosion in the control cabinet by adding an anticondensation heater assembly • -40 °F temperature operation Improve operating temperature to -40 °F by adding tank heaters • Replacement porcelain bushings SP breakers manufactured prior to 1988 utilized epoxy bushings. Siemens can field install replacement porcelain bushings • Manifold assembly Prevent corrosion and leakage on the manifold by replacing the original stainless steel tubing with new copper tubing
SPS2		20-25	• Some models can be uprated to 63kA by adding capacitors.	