



Distribution Static VAR Compensator (D-SVC™) System

Increasing grid and industrial power quality for greater economic performance

AMSC's D-SVC™ (Distribution Static VAR Compensator) is a cost-effective, highly reliable solution that allows large electric loads to operate on the AC power system while minimizing the impacts of voltage sags and flicker problems. AMSC's D-SVC system automatically applies VARs on a cycle-by-cycle basis to maintain steady line voltages adjacent to large inductive loads such as motors, welders, arc furnaces, and pipeline pumping stations. The D-SVC uses AMSC's proven transmission-level D-VAR® STATCOM control platform to bring a transmission-level solution to the distribution environment.

Overview

Reduce start-up processes, lower maintenance cost, extend life of equipment

A highly reliable source of electricity is crucial for end users. Flicker, or rapidly occurring voltage sags caused by sudden and large increases in load current, is commonly caused by rapidly varying loads that require a large amount of real and reactive power such as welders, motors, rock-crushers, sawmills, pipeline pumping stations, and shredders. Poor power quality caused by rapid and repeated voltage fluctuation can dramatically reduce production capacity, damage sensitive equipment and can cause major downtime, reducing overall revenues and profits.

Fix the source of the power quality problem while providing benefit to others nearby

Power quality has also become a major utility issue as they seek to isolate the customers who cause voltage sags and flicker from other utility customers on the same circuits. Voltage sags, transients and voltage flicker are the most common power quality problems. Sags,

temporary reductions in voltage, will cause loss of motor capacity and can interrupt sensitive customer operations, interfering with variable-speed drives, relays and robotics. Sags and flicker are not isolated to the facility that causes it; others miles away from the source of the problem but on the same circuit can be adversely affected. AMSC's D-SVC system mitigates the source of the problem while providing inherent power quality improvements to other key customers on the connected network.

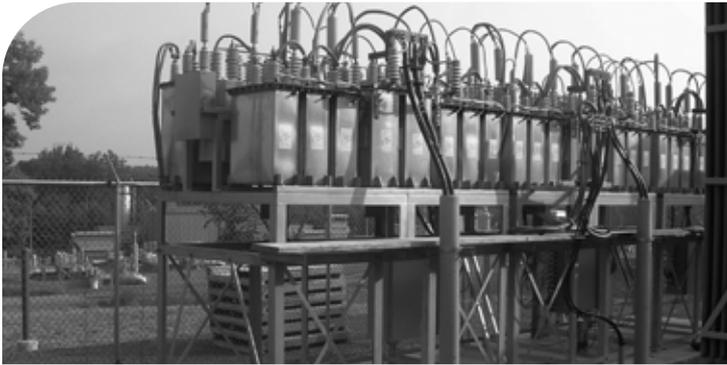
Benefits

Fast, accurate VAR compensation connected at the distribution voltage level

The AMSC D-SVC system's advanced design utilizes solid state switching for fast accurate VAR compensation connected at the distribution voltage level. The D-SVC system's control logic monitors distribution system performance (voltage and load current), adjusting VARs on a cycle-by-cycle basis if necessary. The result is optimal system performance, even under wide swings in circuit loading.



- Static (solid state) valves, can switch once per cycle
- Transient free switching, eliminating restrike and ringing
- High speed control system: integral sensing, actuating and system diagnostics
- No moving parts, operates as needed (>100k operations/day)
- Standard capacitors, fuses
- Minimal installation and commissioning time required
- No external cooling
- Integral harmonic filtering for clean reactive support



The D-SVC system:
Compact, highly reliable,
and simple maintenance
make this an ideal solution
for industrial facilities.

Cost-effective solution and simple maintenance make this an ideal solution for the industrial user

More affordable than alternative solutions, this high speed control system boasts integral sensing, actuating and system diagnostics, has no moving parts, operates as needed (>100k operations/day) and eliminates flicker, ringing transients and re-strike. The on-board management system provides complete “set and forget” operation, including automatic restart. With no moving parts, high reliability and simple maintenance are designed in. The system does not require external cooling. The D-SVC system gives electric utilities and large electricity users the most cost-effective way to connect large disturbing loads to weak circuits.

Small, flexible footprint

AMSC’s D-SVC can be configured to meet specific customer requirements. Highly compact, a D-SVC system can be installed within a limited substation footprint, mounted on poles, or can be placed on platform between poles, or provided in an enclosed form factor. Installation and commissioning is quick and can be complete in a matter of a couple of days.

SPECIFICATIONS

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| Direct Connection: | 5 kV - 15 kV |
| Frequency: | 50 or 60 Hz |
| Ratings: | The modular D-SVC system design uses standard system modules to cost-effectively tailor a system to your application |
| Response Time: | 1-cycle |
| Control Systems: | 3-phase (optimized for motor operations) |
| Harmonics: | Integral Harmonic Filters are included |
| System Monitoring: | Digital recording of system conditions, D-SVC system action, multiple outputs, alarms and warning signals, accepts multiple inputs |
| Ambient Temperature: | -40°C to +40°C |
| Other: | Minimal site preparation and start-up support Compact installation for minimal footprint Optional Remote Monitoring Environmentally benign Ambient air cooling Robust operation during low voltage conditions |
| Not Required | Special building, water, air or fan cooling or special maintenance staff |

APPLICATIONS

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| Sawmills, rock crushers, quarrying and mining operations, water and wastewater pump stations | These operations are frequently located on long and weak distribution feeders. Applying the D-SVC system eliminates or defers the need for circuit upgrades and can be moved when the need no longer exists. |
| Large motors at car shredders, car crushers, natural gas pipelines and chemical processes (typ. 2-14,000 HP) | An alternative to installing a seven figure transmission line upgrade, the D-SVC system can reduce overall project time by months. |
| Arc furnaces, foundries and welders | The D-SVC system can be used instead of transmission upgrades or can eliminate the use of a traditional static VAR compensator creating a minimum capital savings of greater than 65% and a time savings of months or years. |